

Chapter 2. **Project Alternatives**

[this page left blank intentionally]

Chapter 2. Project Alternatives

This section describes the project action and the design alternatives that were developed to meet the identified need through accomplishing the defined purposes, while avoiding or minimizing environmental impacts. The alternatives are:

- Alternative 1 – No-Build,
- Alternative 2 – Southerly Alignment,
- Alternative 3 – Existing Alignment, and
- Alternative 4 – Northerly Alignment.

This chapter defines the project in further detail and discusses the project alternatives considered.

2.1 Project Description

The project is located in San Bernardino County on SR-58 starting 2.4 miles west of Hidden River Road and ends 0.7 miles east of Lenwood Road. The physical improvements for the project would extend from PM 22.2 to PM 31.1; however, in order to account for signage during construction, the total project limits would extend from PM 21.7 to PM 31.6. The project covers a distance of 8.9 miles.

Within the project limits, existing SR-58 is a conventional two-lane highway with 12-foot lanes and shoulders varying from six to eight feet wide. All existing local road intersections are stop-controlled for the local streets with the exception of Lenwood Road which is signalized. The purpose of the project is to maintain route continuity, relieve congestion, upgrade the pavement structural and roadway cross-section to meet current standards, improve safety and operations within the project limits.

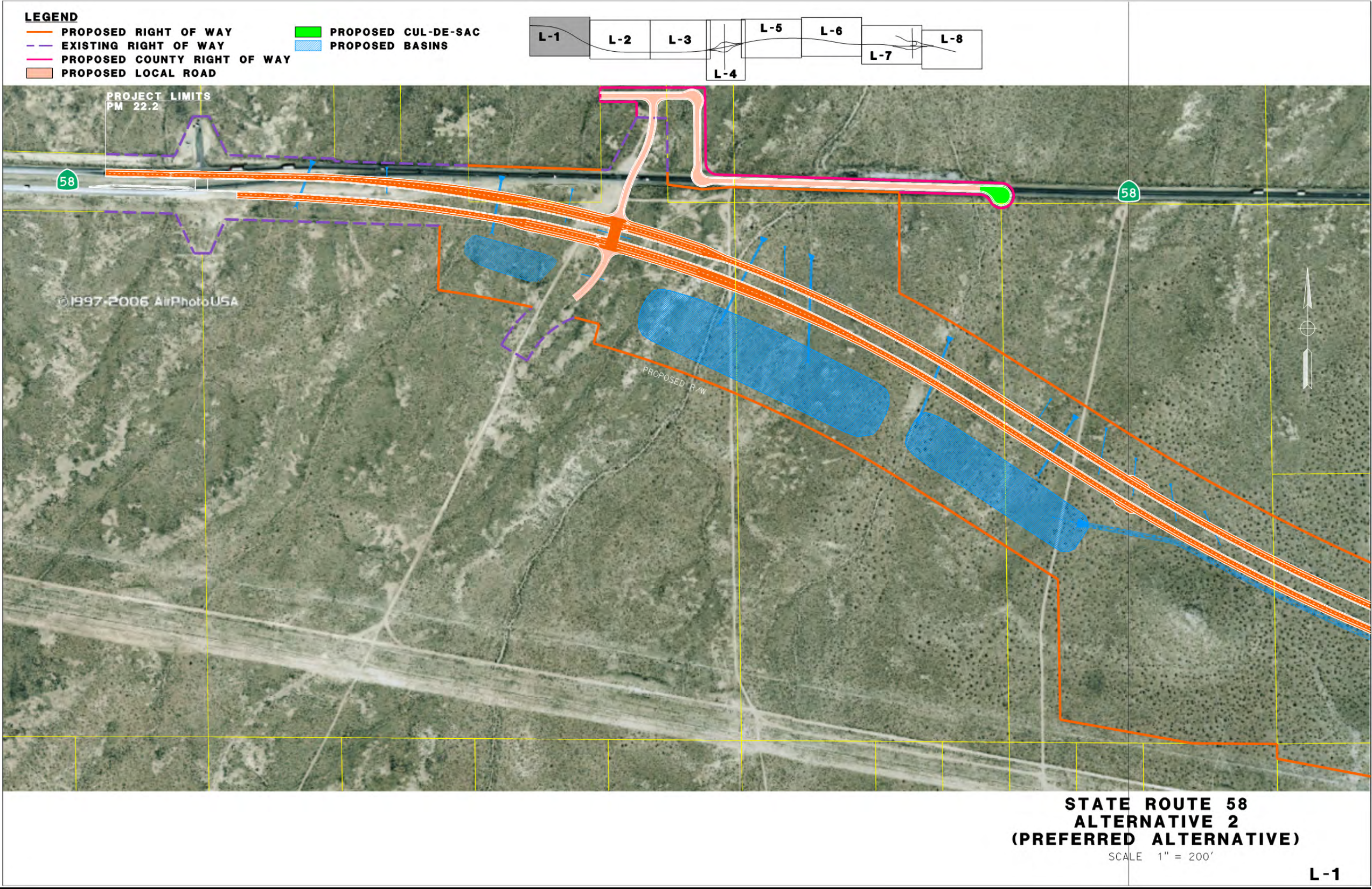
2.2 Alternatives

2.2.1 Project Alternatives

Various project alternatives have been evaluated and screened for engineering feasibility, cost, environmental implications, right of way requirements, and level of performance. In 1991, a Project Approval Report (PAR) provided preliminary data on various alternatives. In 2002, a Value Analysis was completed by Caltrans to further evaluate project alternatives. As the process continued, the public and various resource agencies were requested to provide input on the project's purpose and need and the alternatives under study. The alternatives presented in Figures 2.1 through 2.3 show the alignments and features of each Alternative. These figures reflect Caltrans' recommendations accomplished through the environmental scoping process, which evaluated public and resource agency comments on the project purpose and need and the alternatives under study.

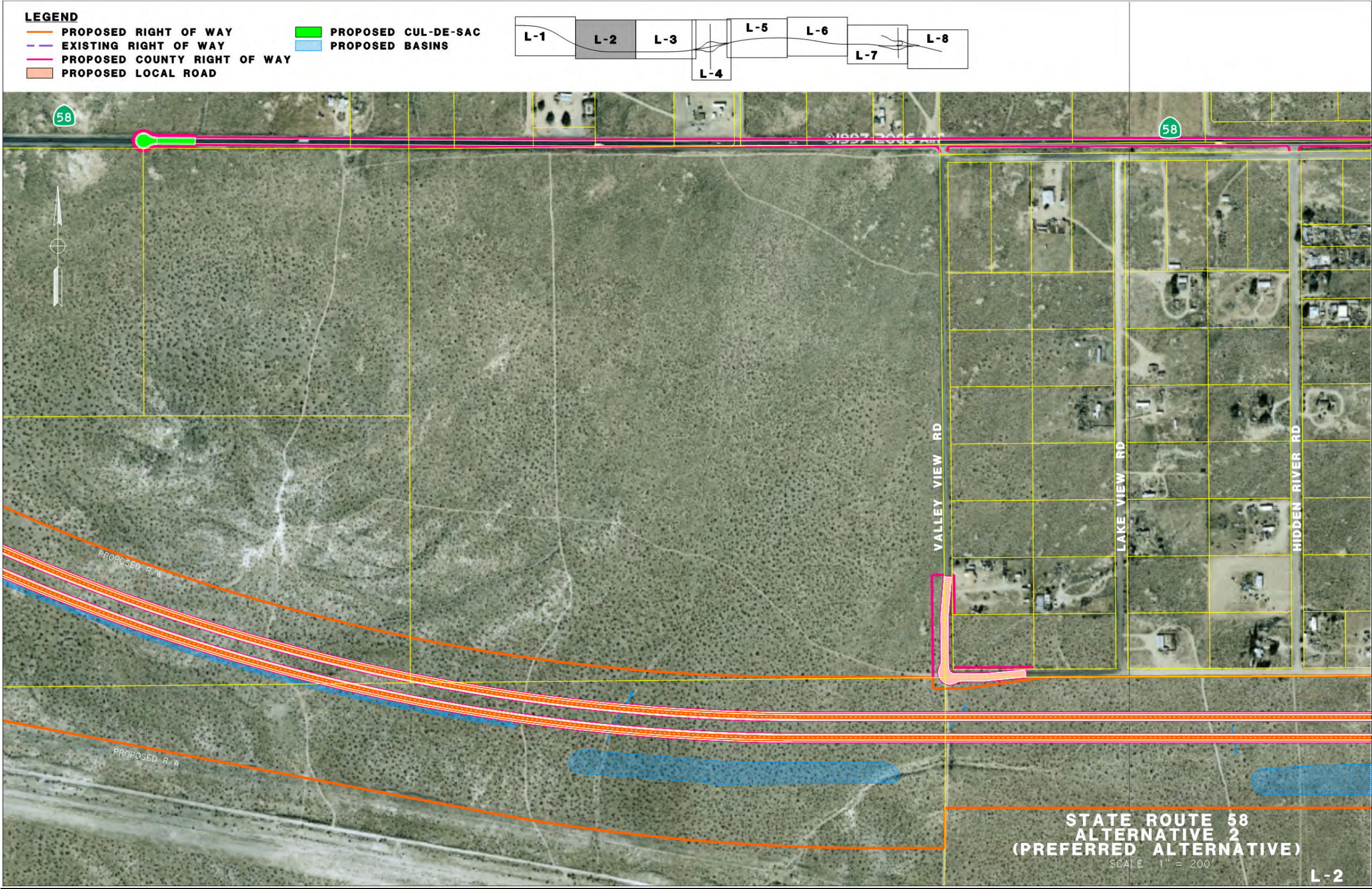
[this page left blank intentionally]

Figure 2.1: Alternative 2 – Southerly Alignment (Preferred Alternative), Sheet 1



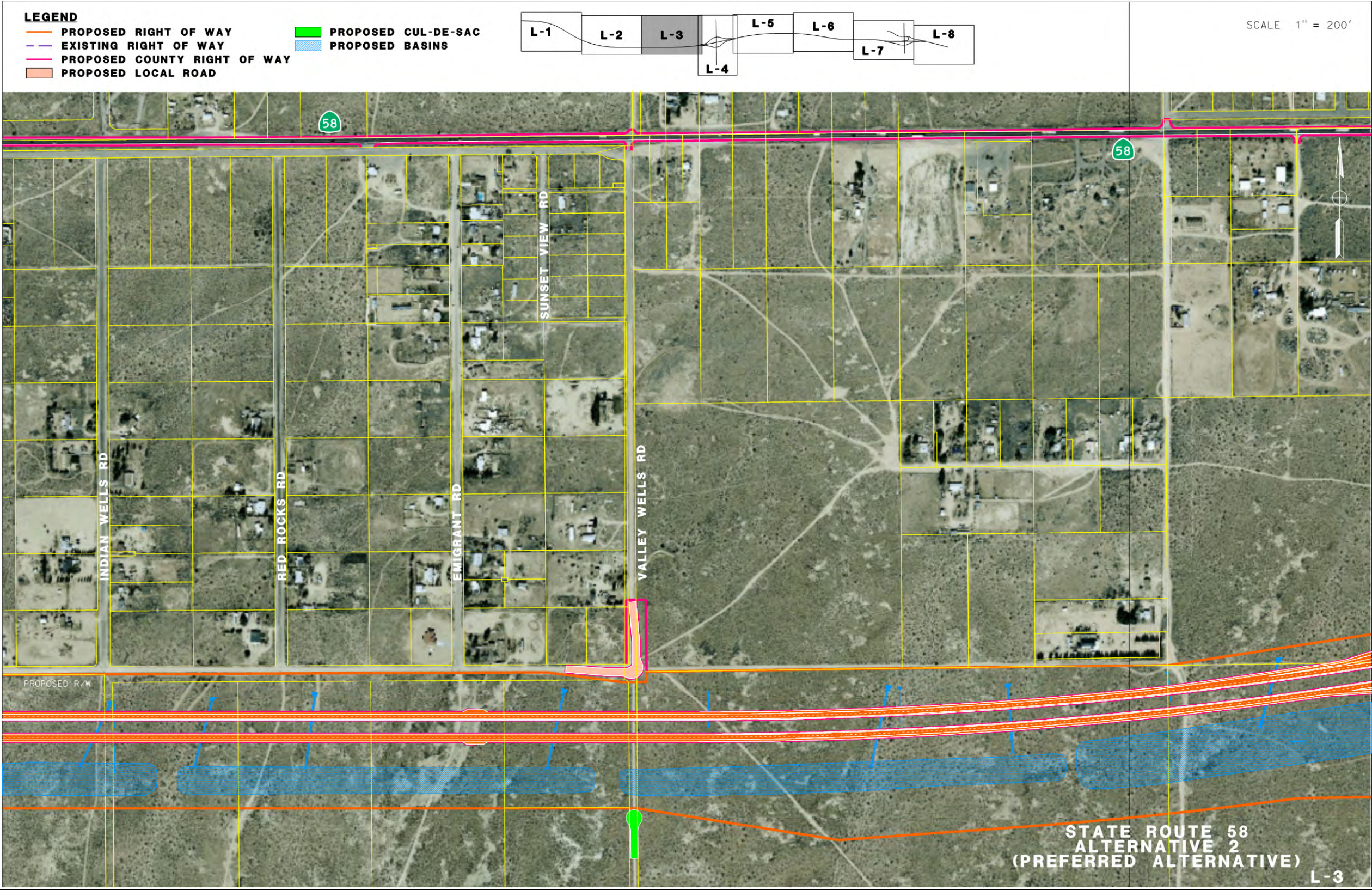
[this page left blank intentionally]

Figure 2.1: Alternative 2 – Southerly Alignment (Preferred Alternative), Sheet 2



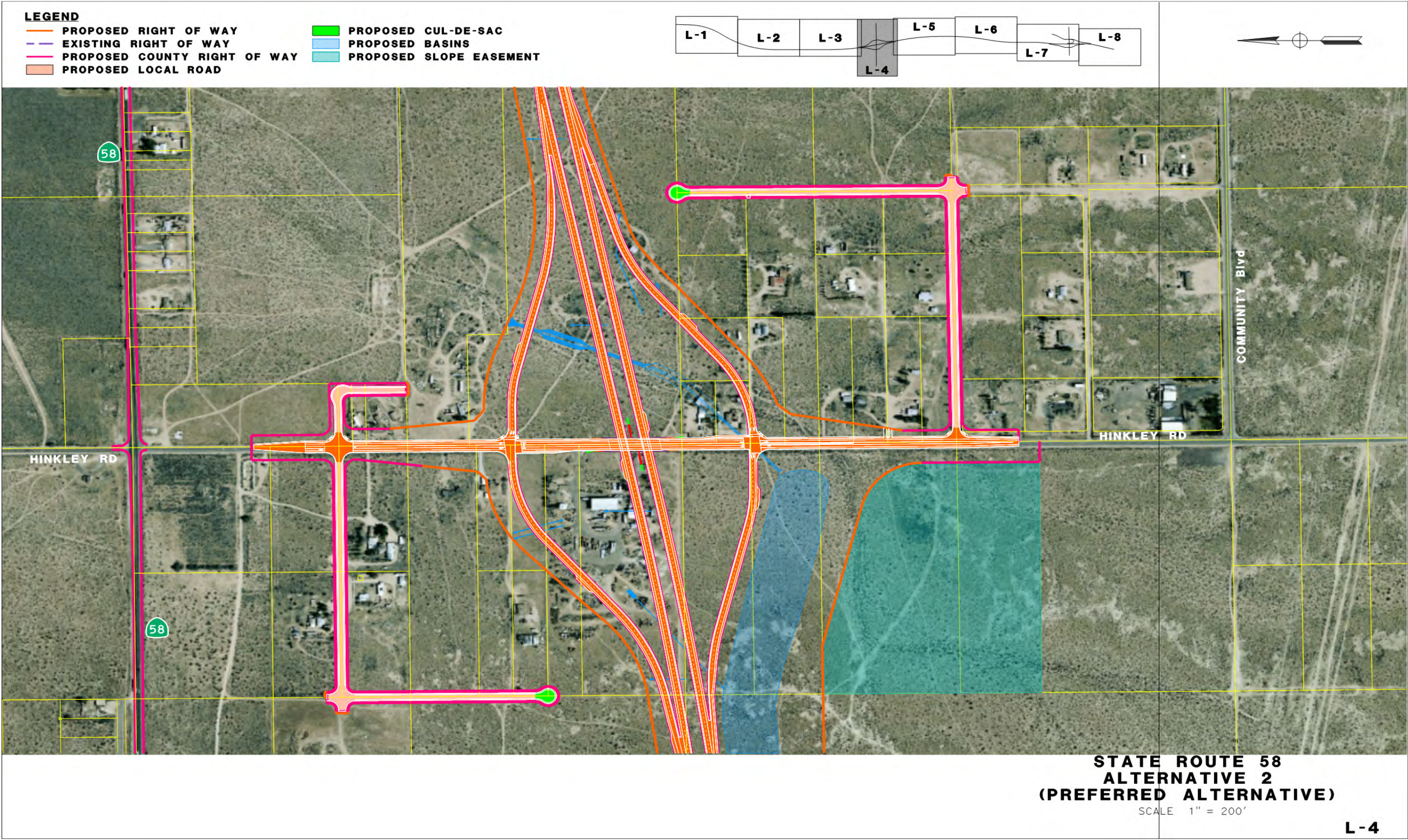
[this page left blank intentionally]

Figure 2.1: Alternative 2 – Southerly Alignment (Preferred Alternative), Sheet 3



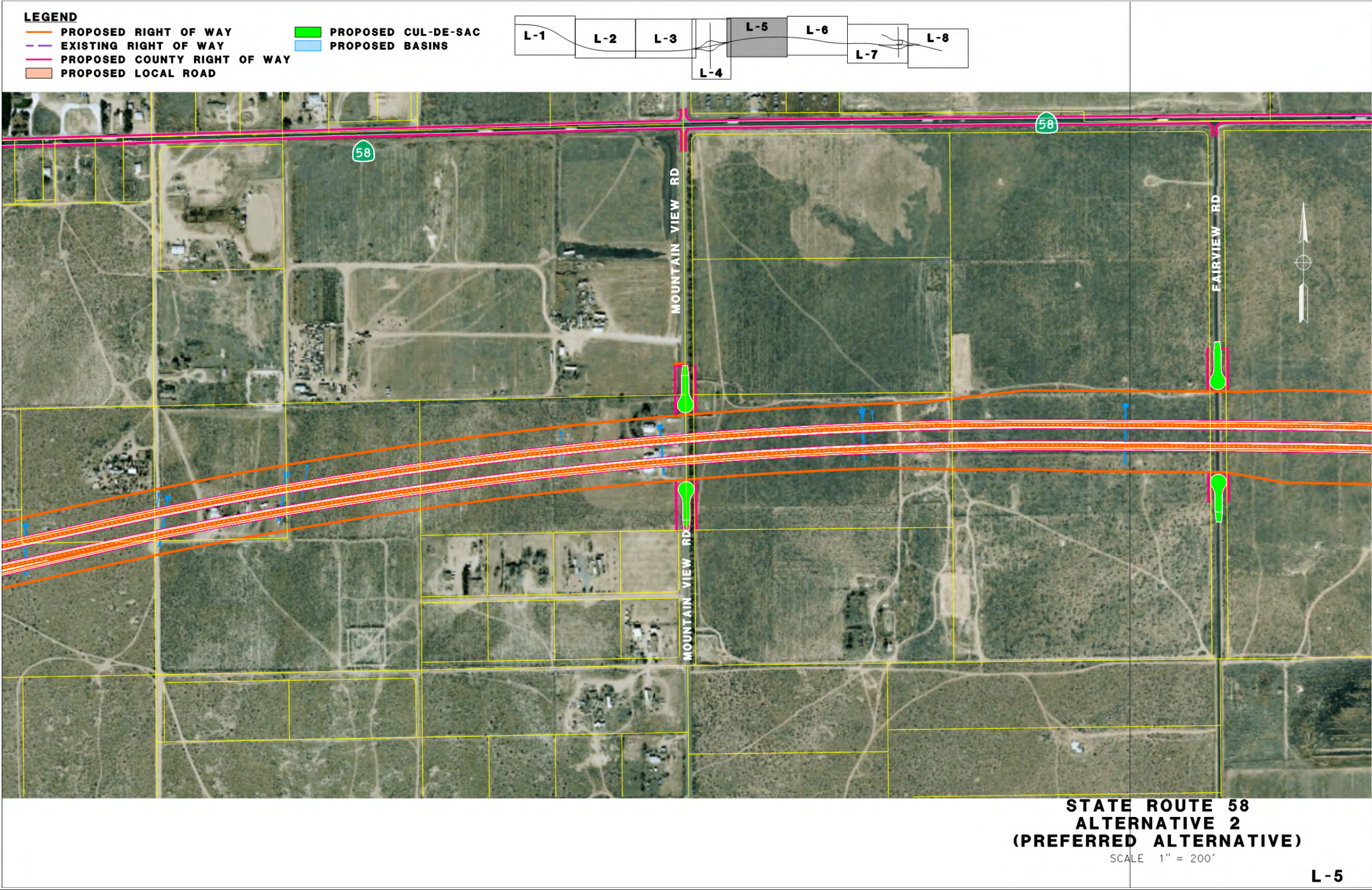
[this page left blank intentionally]

Figure 2.1: Alternative 2 – Southerly Alignment (Preferred Alternative), Sheet 4



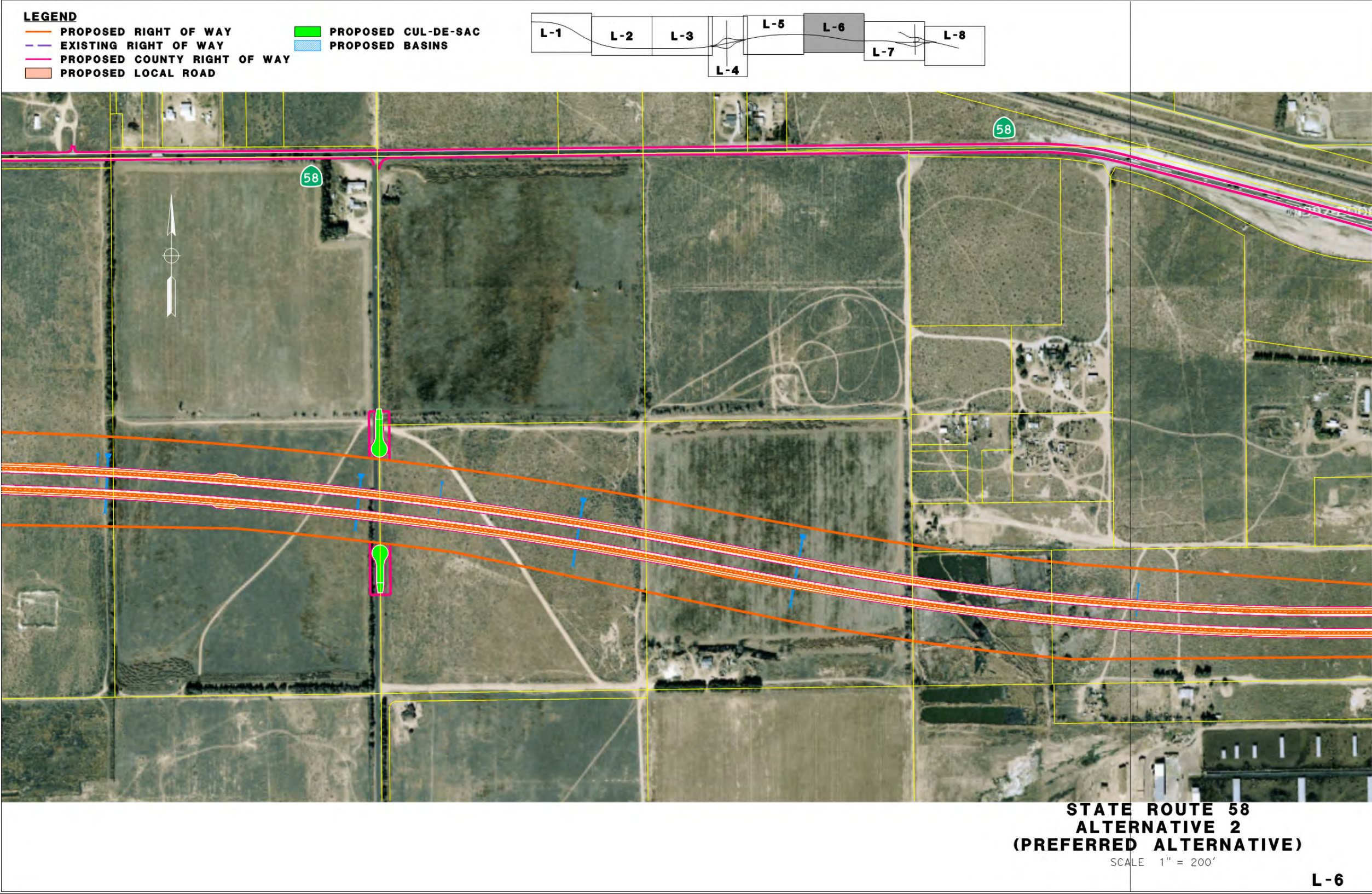
[this page left blank intentionally]

Figure 2.1: Alternative 2 – Southerly Alignment (Preferred Alternative), Sheet 5



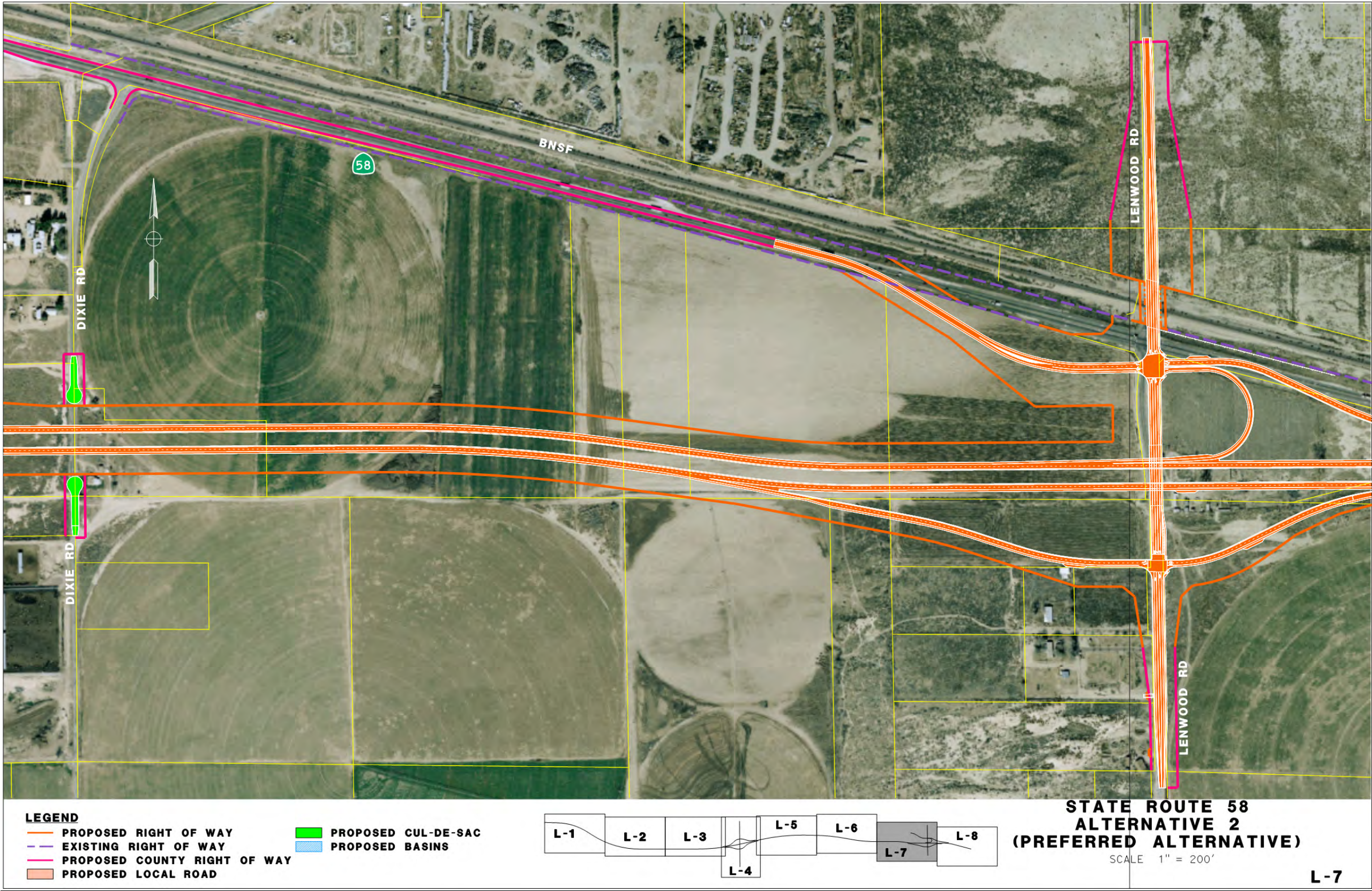
[this page left blank intentionally]

Figure 2.1: Alternative 2 – Southerly Alignment (Preferred Alternative), Sheet 6



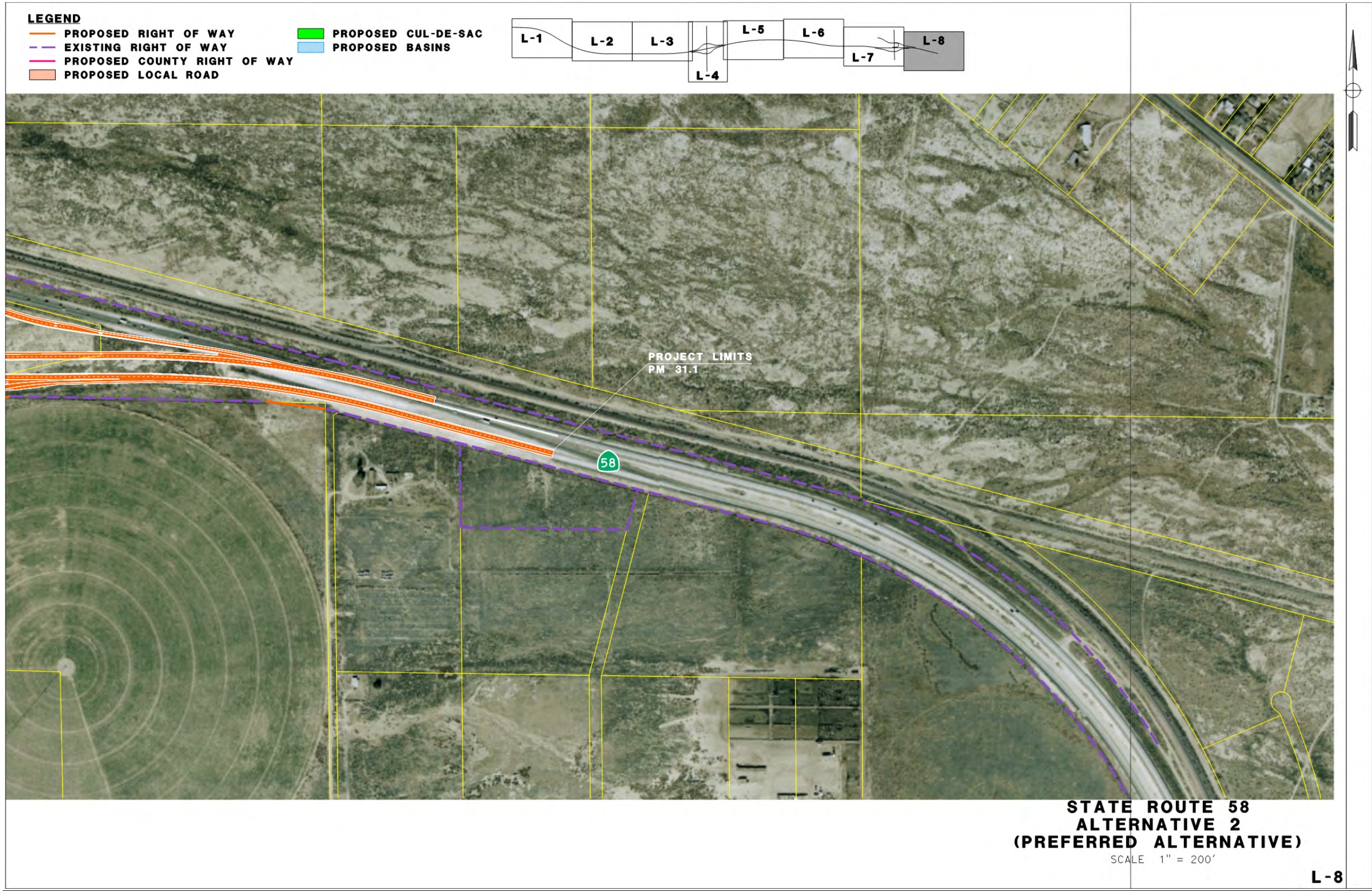
[this page left blank intentionally]

Figure 2.1: Alternative 2 – Southerly Alignment (Preferred Alternative), Sheet 7



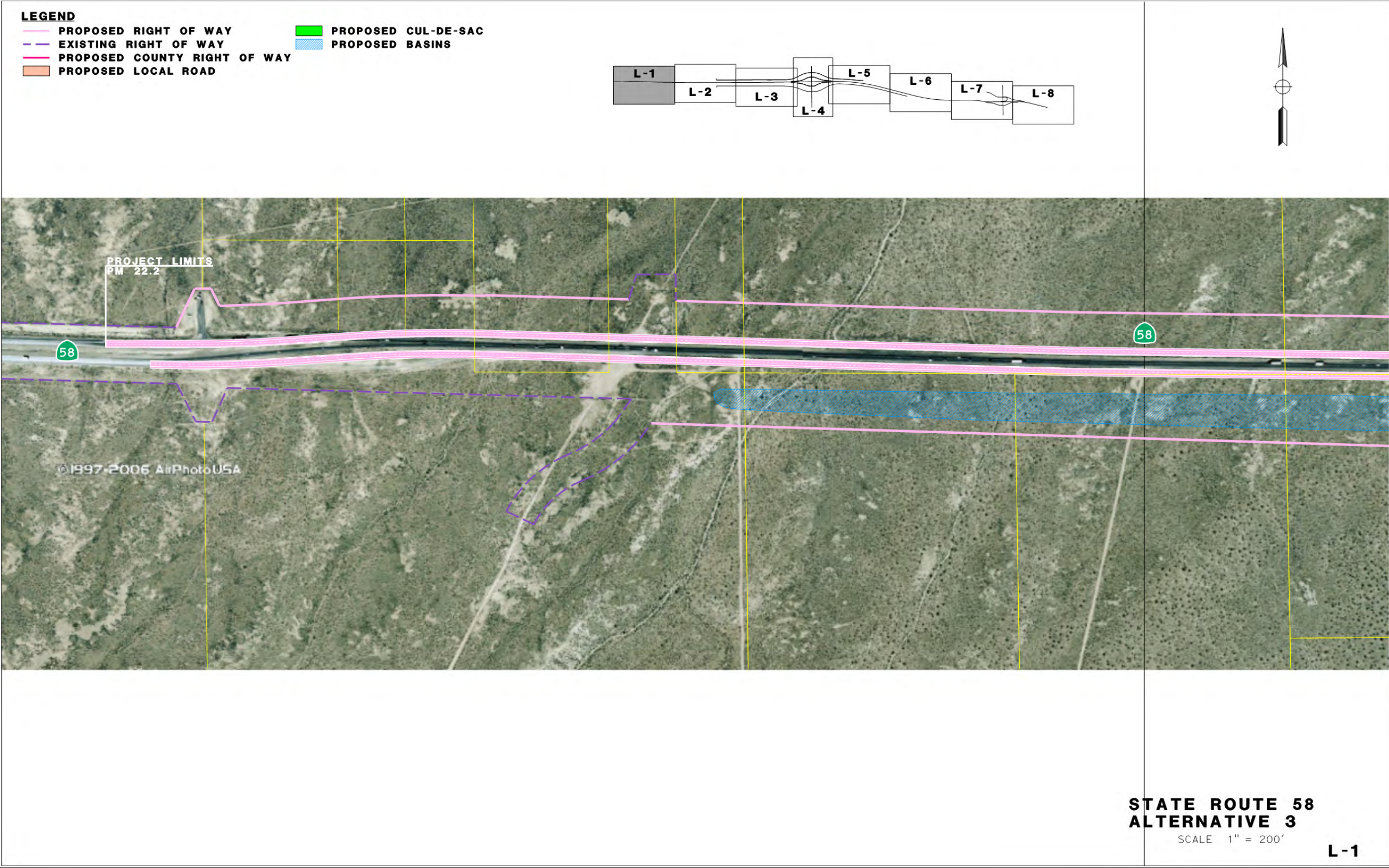
[this page left blank intentionally]

Figure 2.1: Alternative 2 – Southerly Alignment (Preferred Alternative), Sheet 8



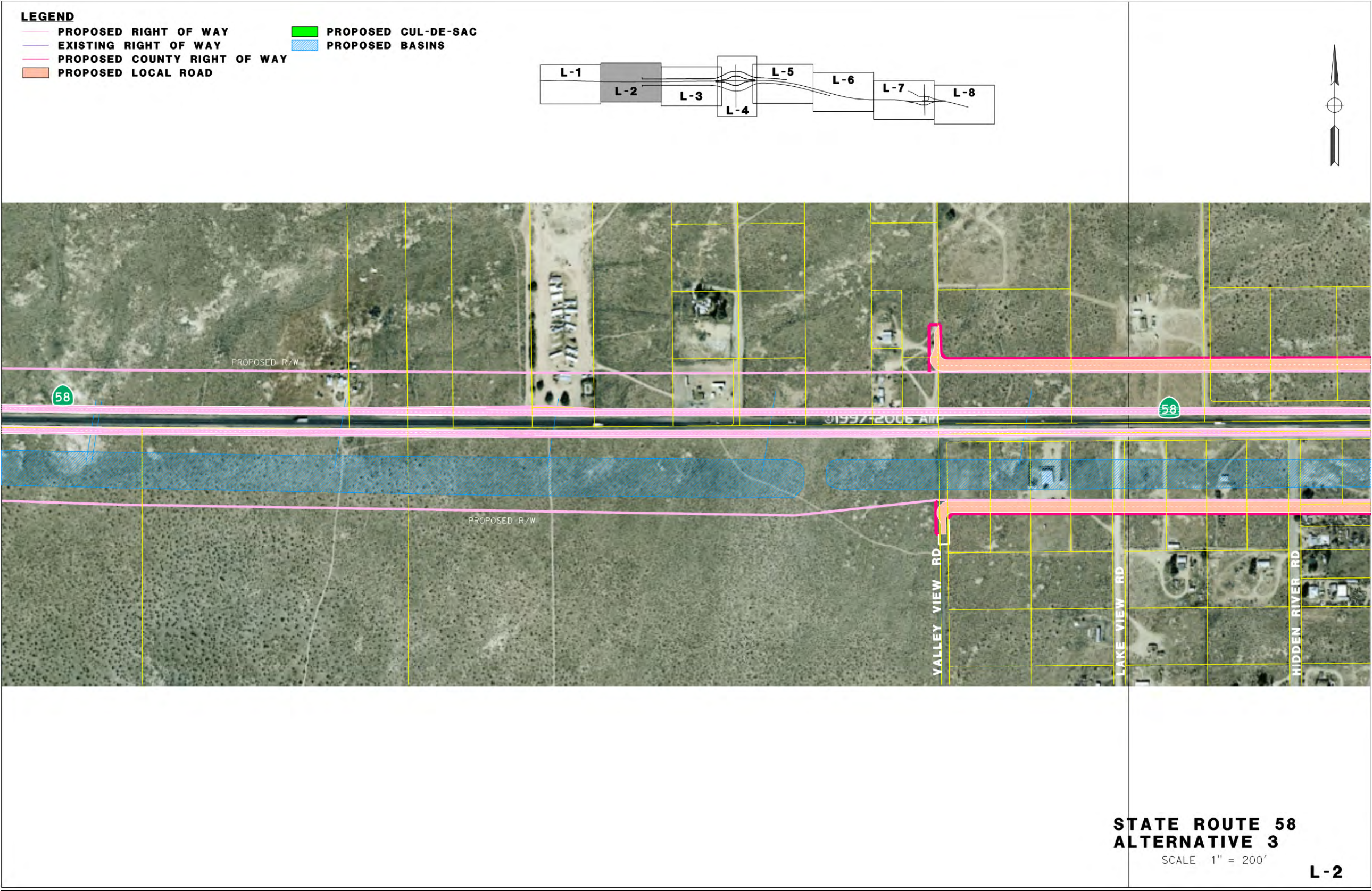
[this page left blank intentionally]

Figure 2.2: Alternative 3 – Center/Existing Alignment, Sheet 1



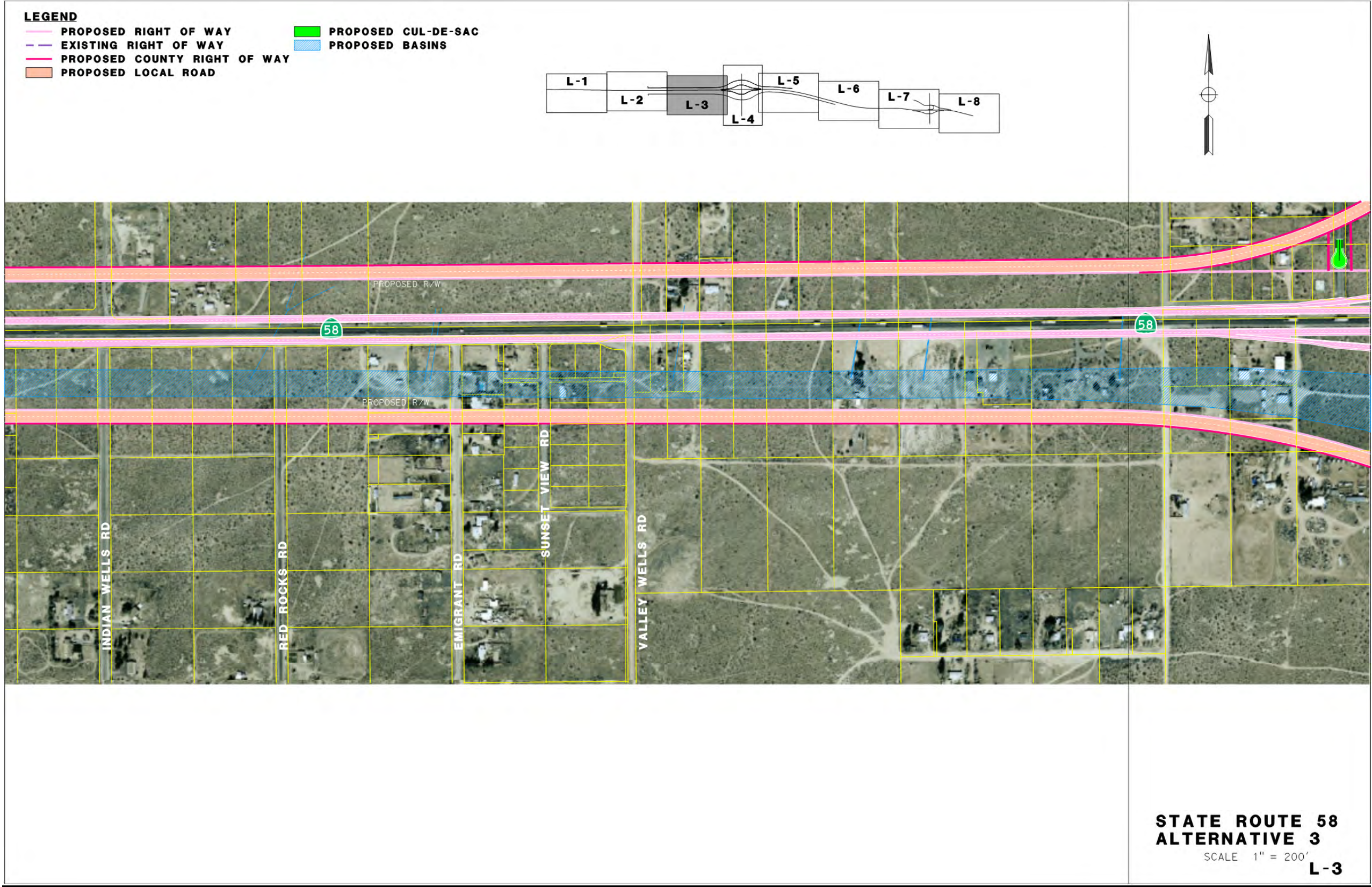
[this page left blank intentionally]

Figure 2.2: Alternative 3 – Center/Existing Alignment, Sheet 2



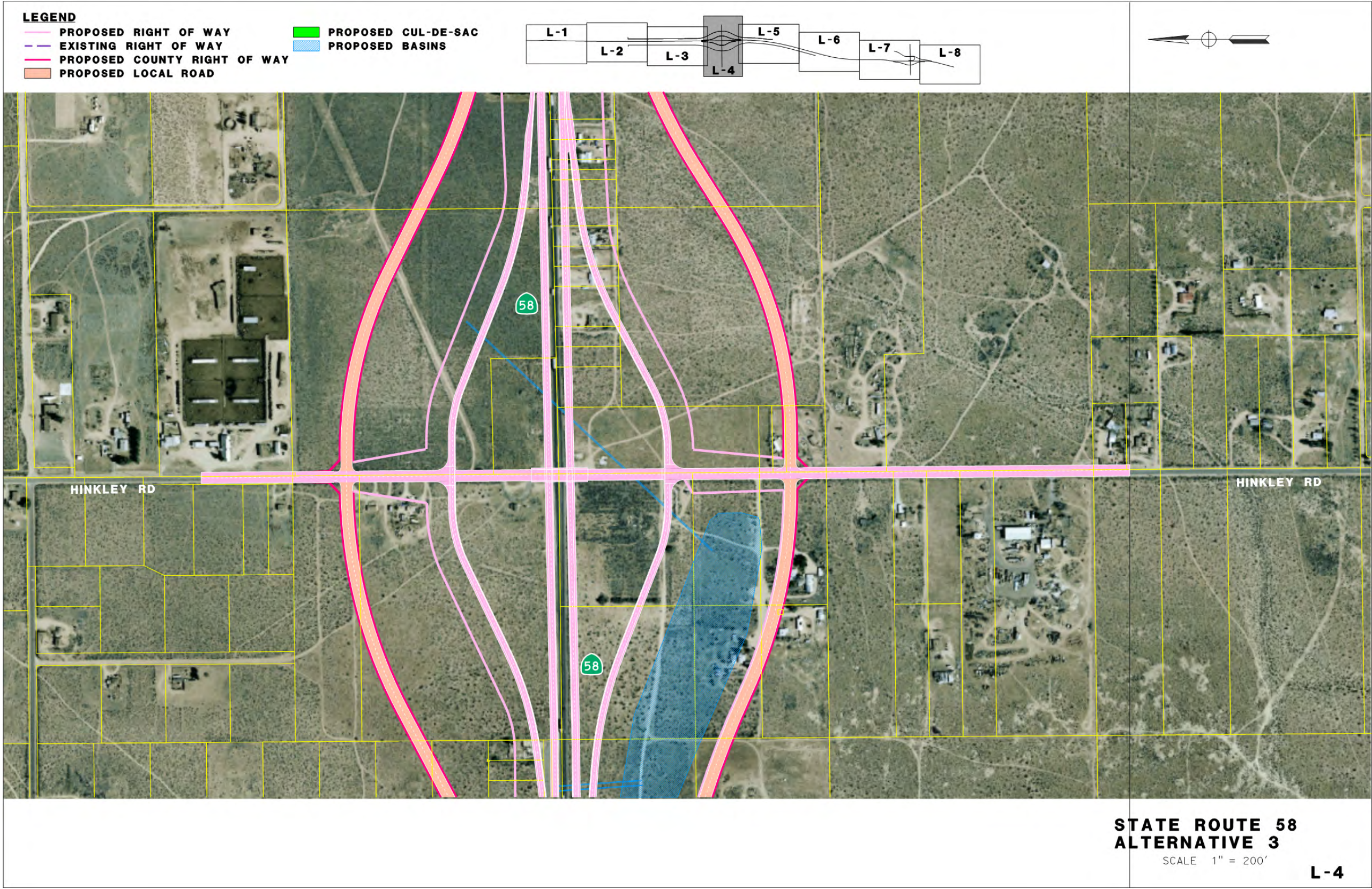
[this page left blank intentionally]

Figure 2.2: Alternative 3 – Center/Existing Alignment, Sheet 3



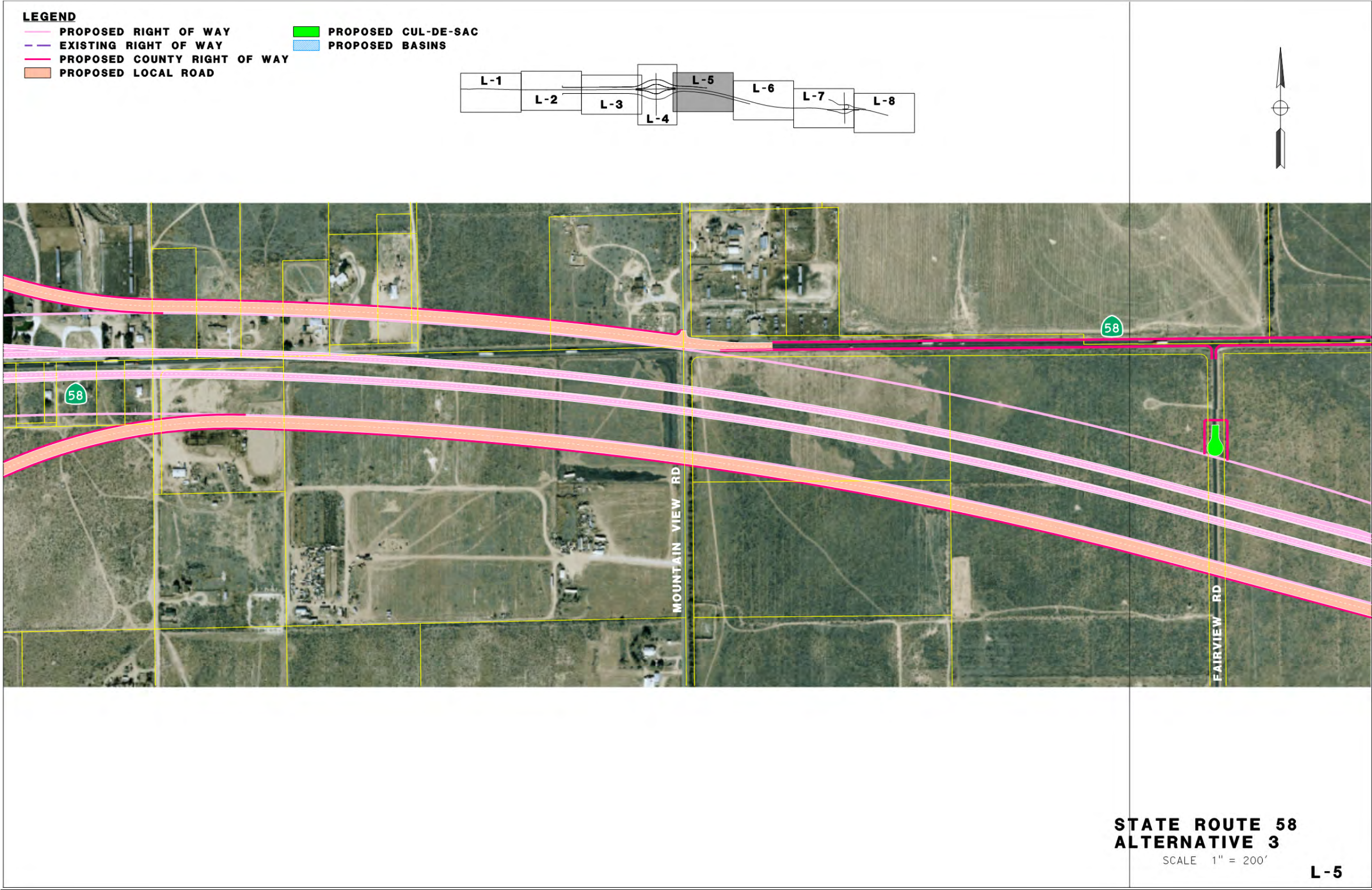
[this page left blank intentionally]

Figure 2.2: Alternative 3 – Center/Existing Alignment, Sheet 4



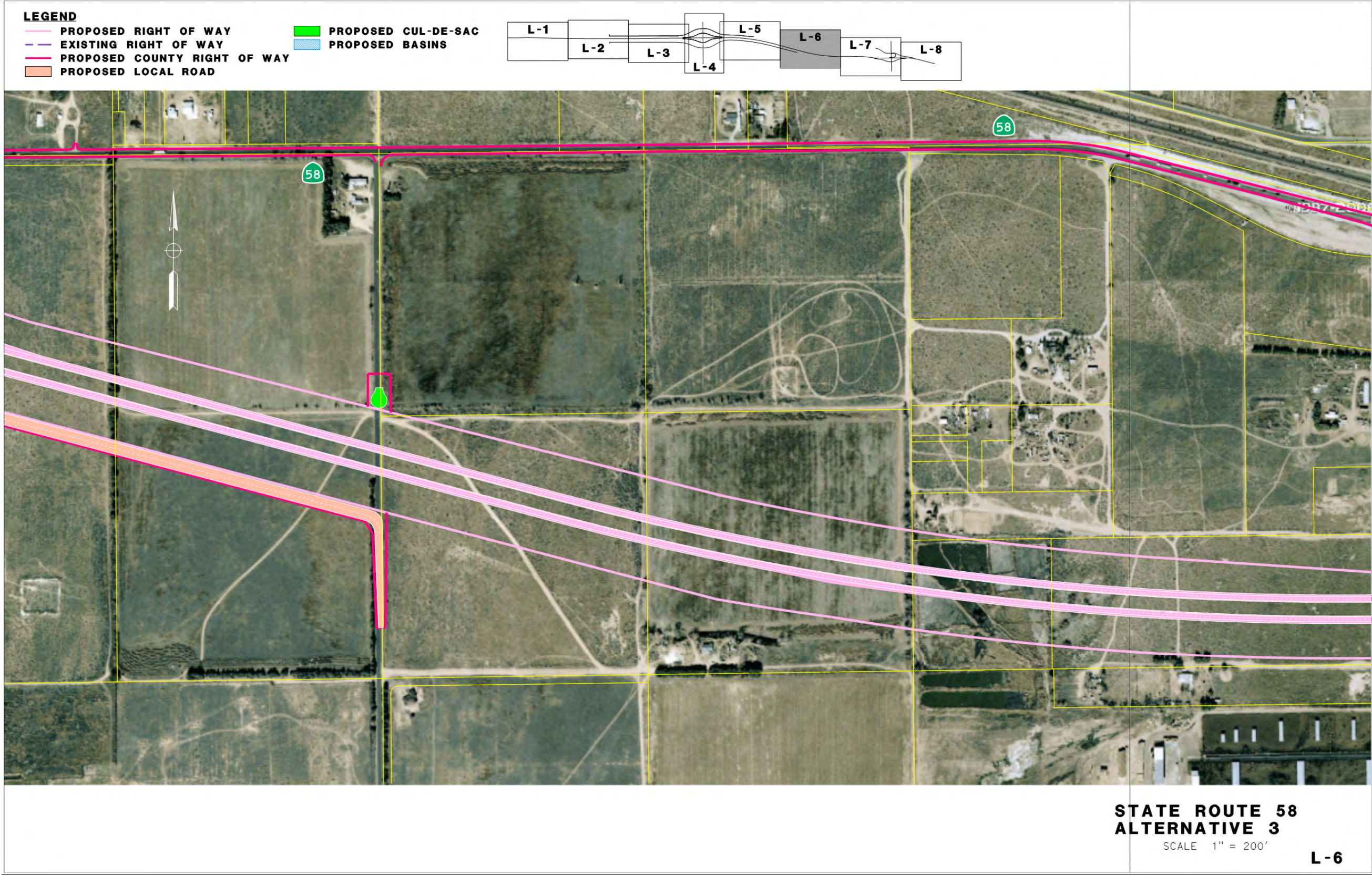
[this page left blank intentionally]

Figure 2.2: Alternative 3 – Center/Existing Alignment, Sheet 5



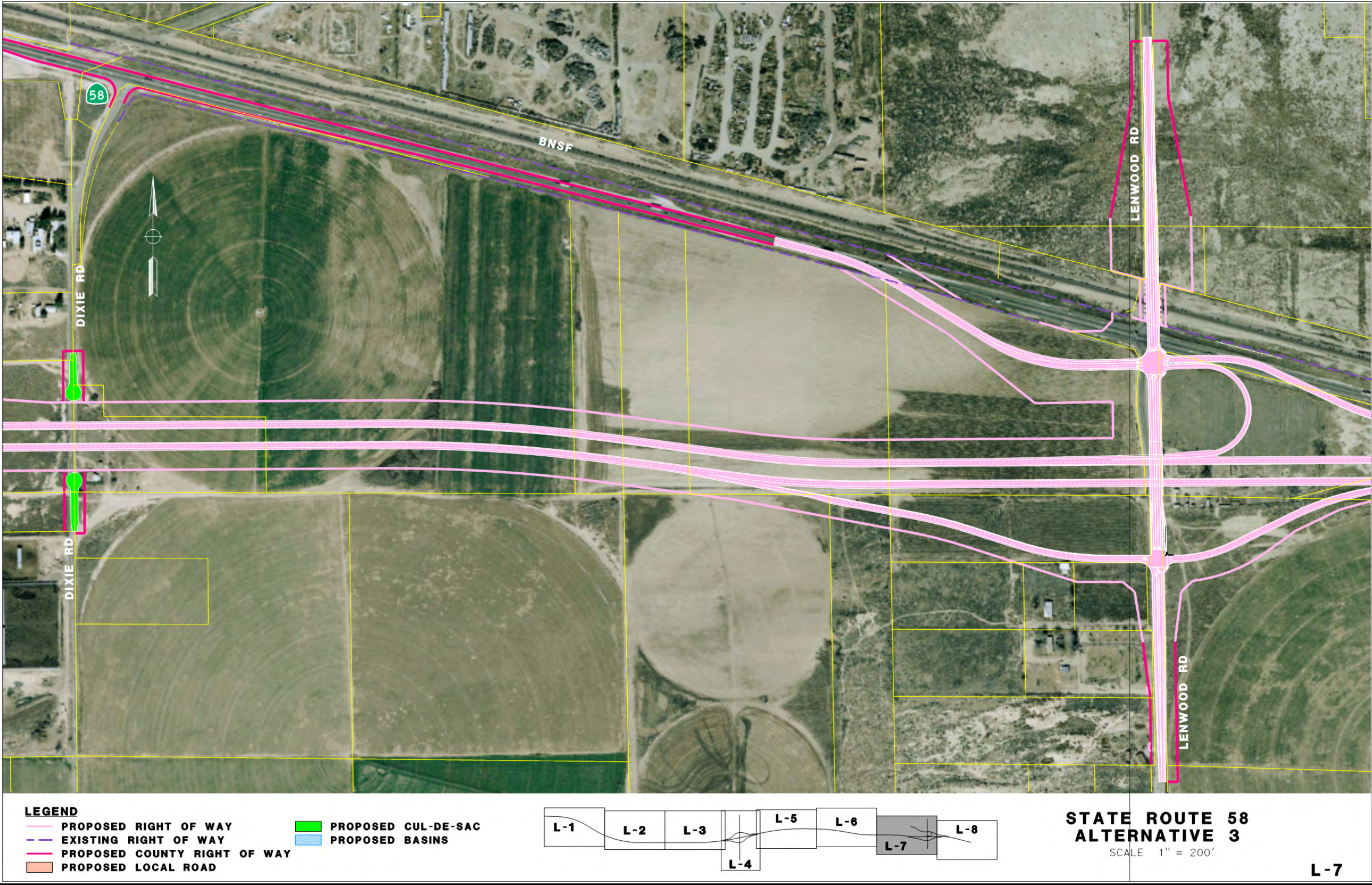
[this page left blank intentionally]

Figure 2.2: Alternative 3 – Center/Existing Alignment, Sheet 6



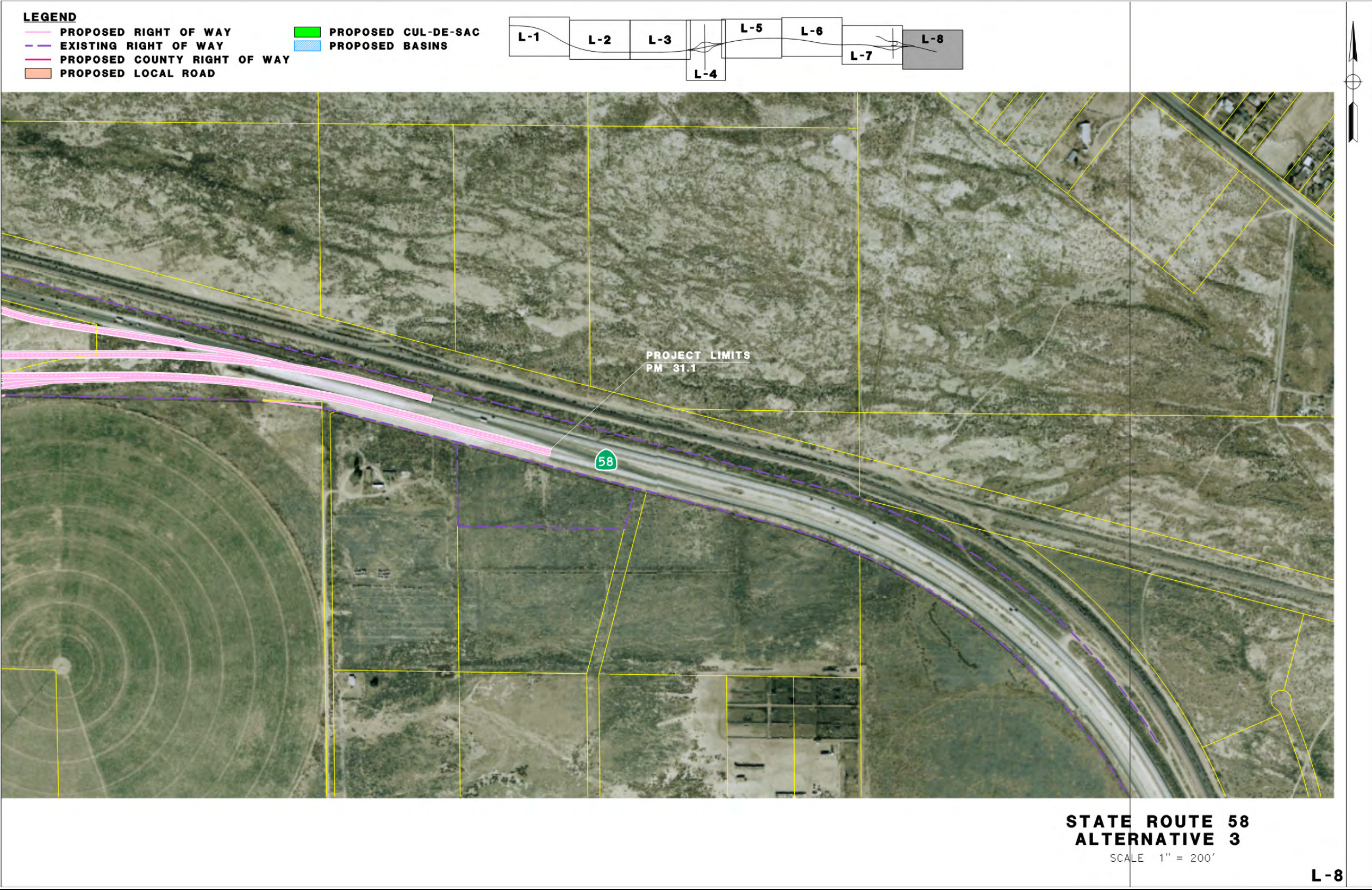
[this page left blank intentionally]

Figure 2.2: Alternative 3 – Center/Existing Alignment, Sheet 7



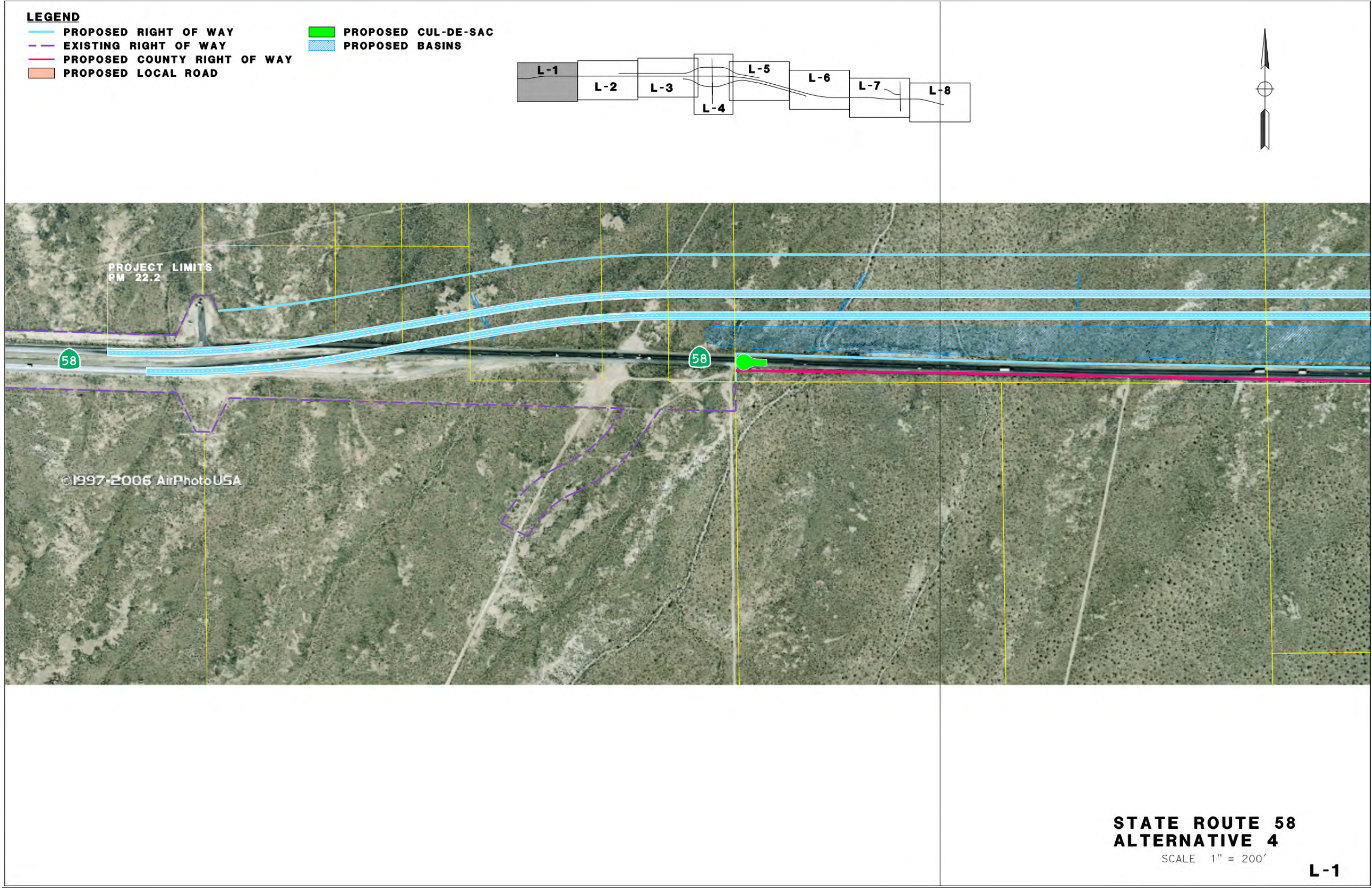
[this page left blank intentionally]

Figure 2.2: Alternative 3 – Center/Existing Alignment, Sheet 8



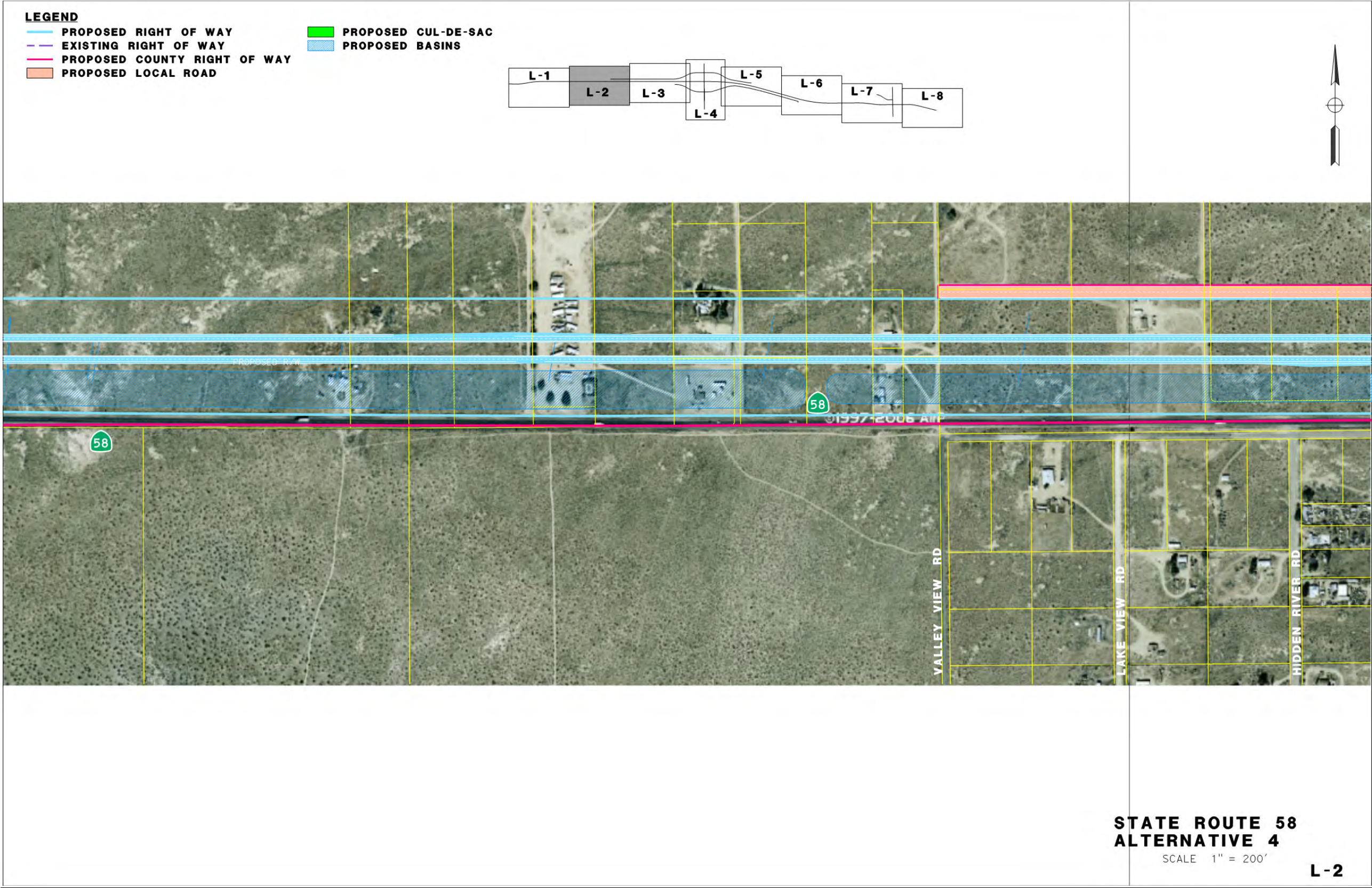
[this page left blank intentionally]

Figure 2.3: Alternative 4 – Northerly Alignment, Sheet 1



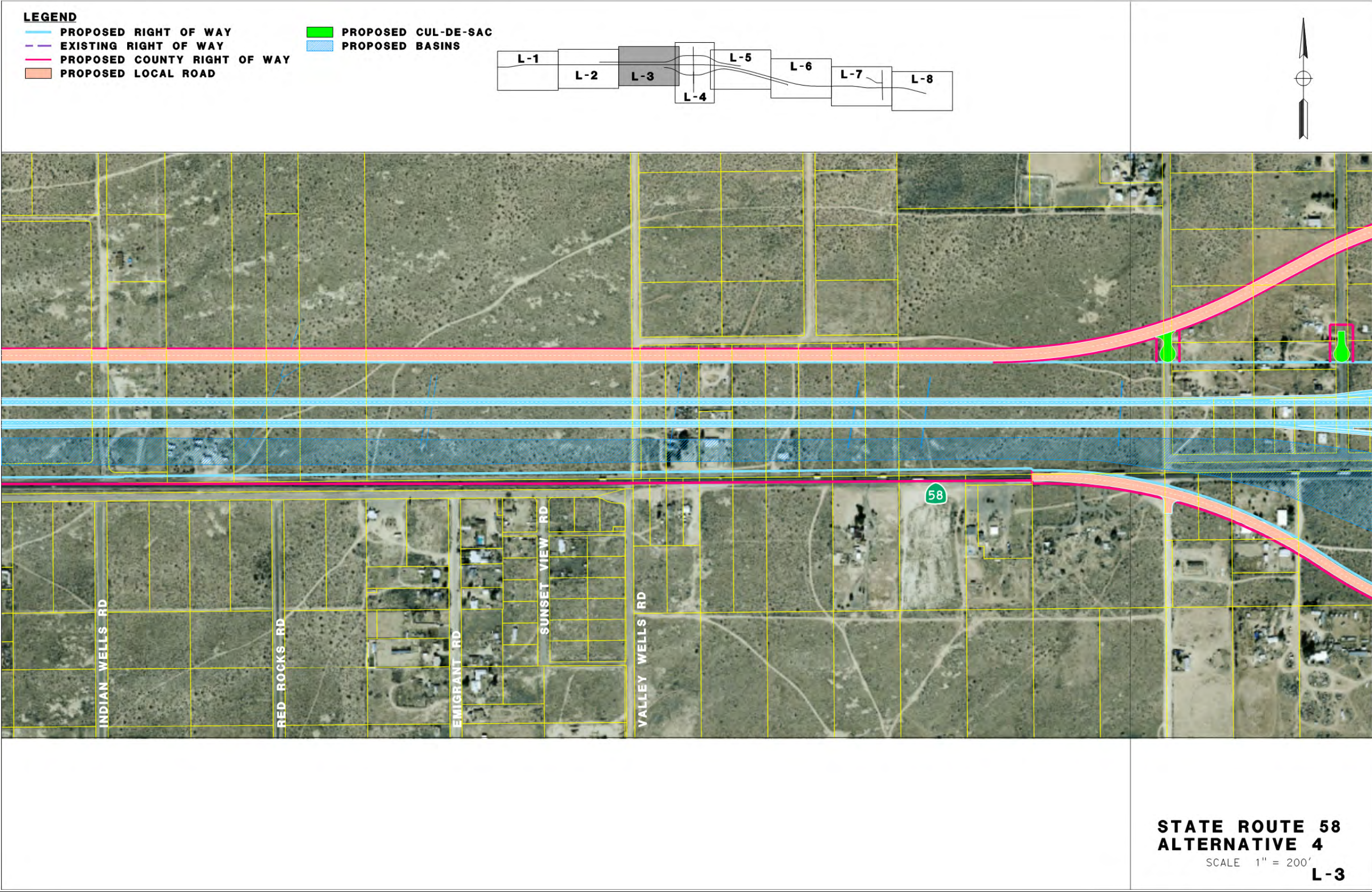
[this page left blank intentionally]

Figure 2.3: Alternative 4 – Northerly Alignment, Sheet 2



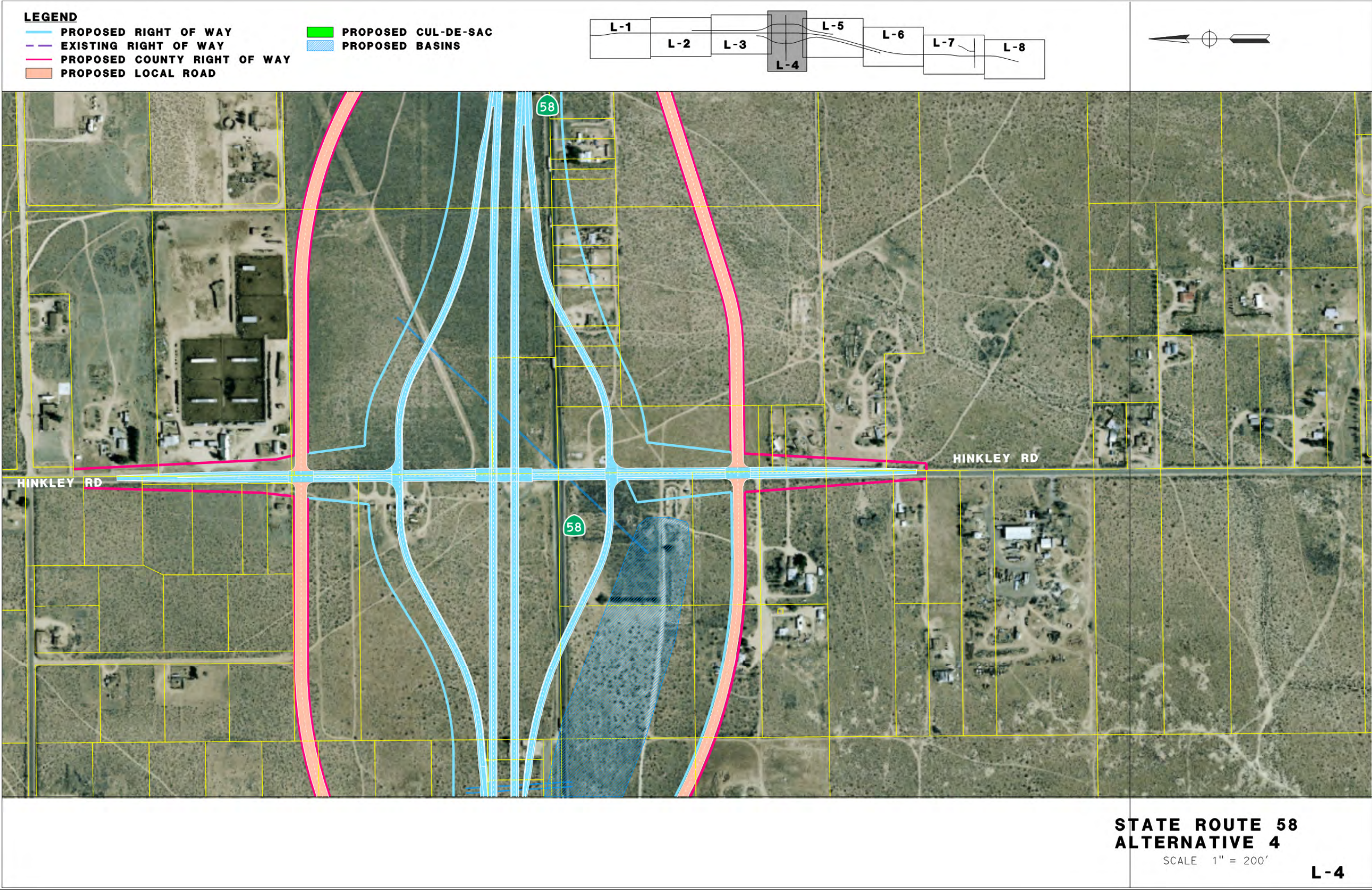
[this page left blank intentionally]

Figure 2.3: Alternative 4 – Northerly Alignment, Sheet 3



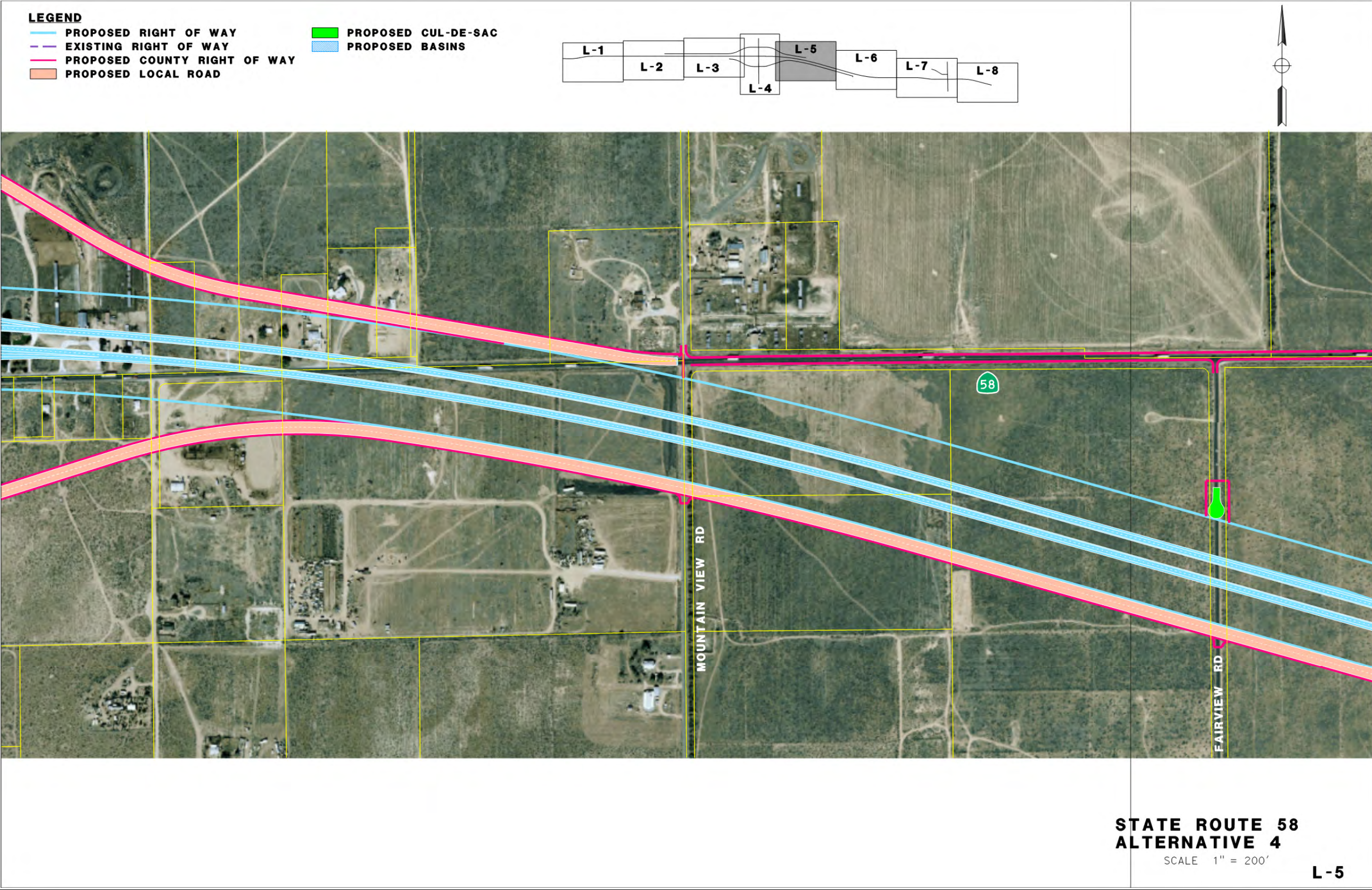
[this page left blank intentionally]

Figure 2.3: Alternative 4 – Northerly Alignment, Sheet 4



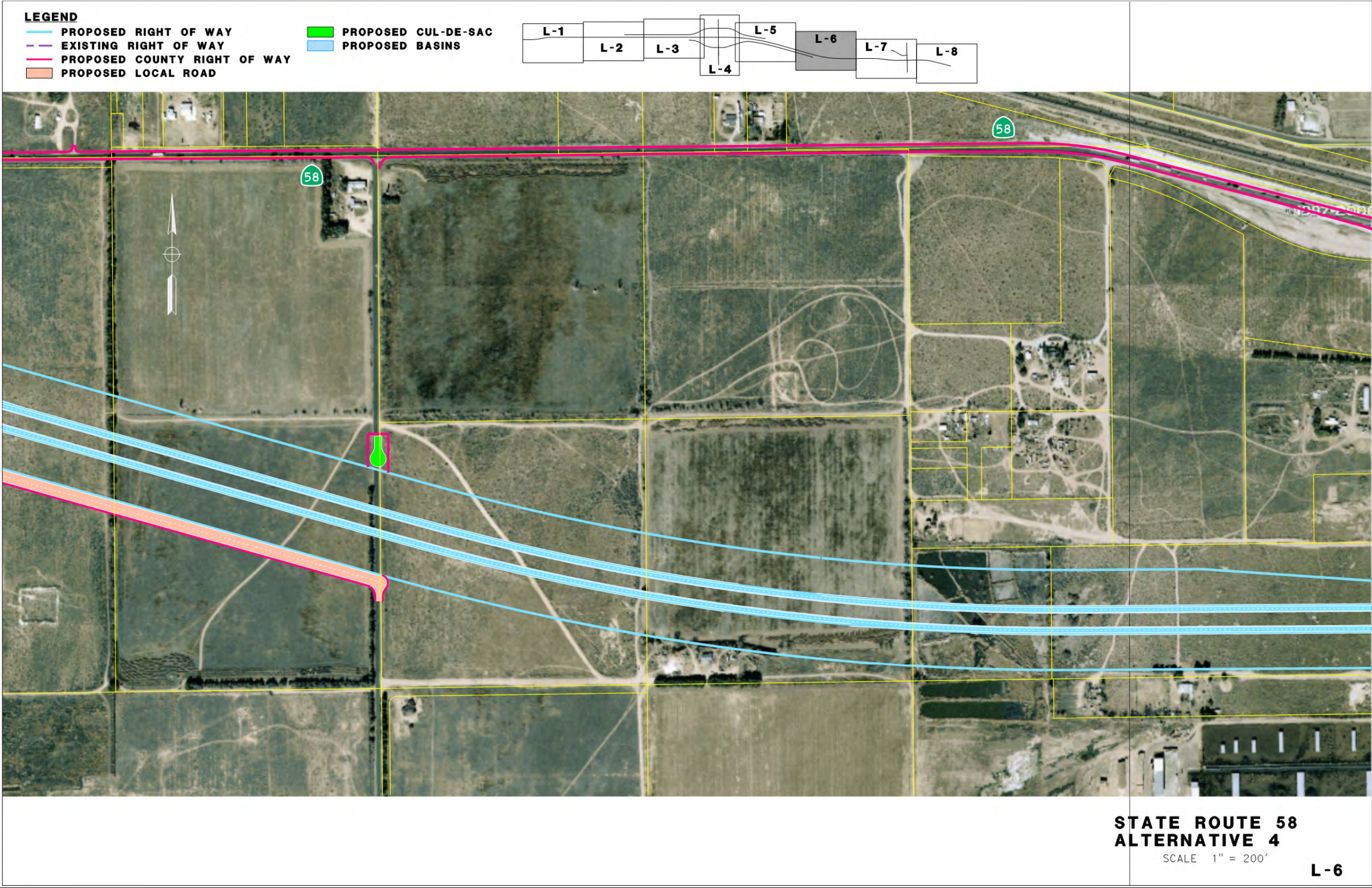
[this page left blank intentionally]

Figure 2.3: Alternative 4 – Northerly Alignment, Sheet 5



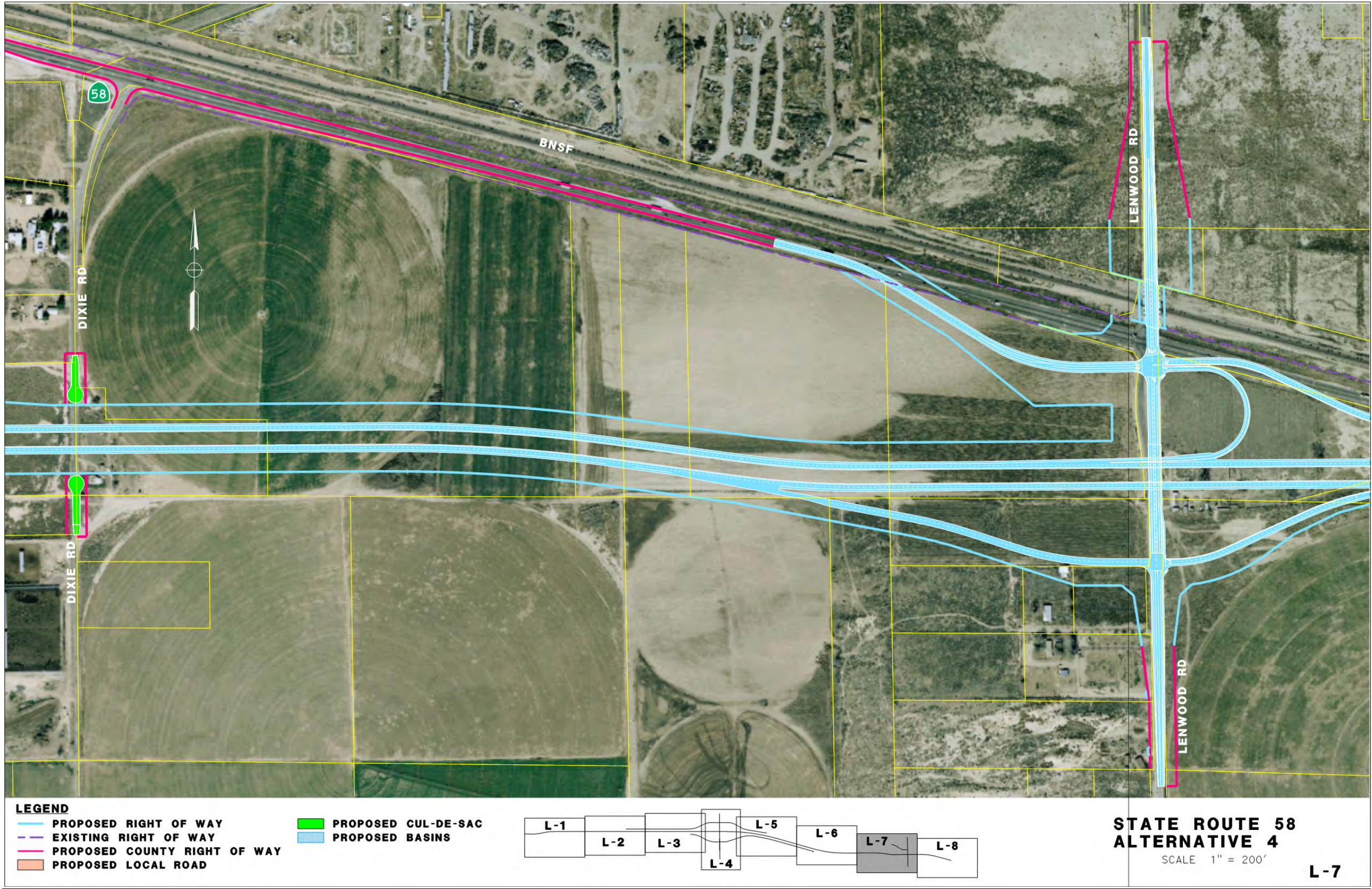
[this page left blank intentionally]

Figure 2.3: Alternative 4 – Northerly Alignment, Sheet 6



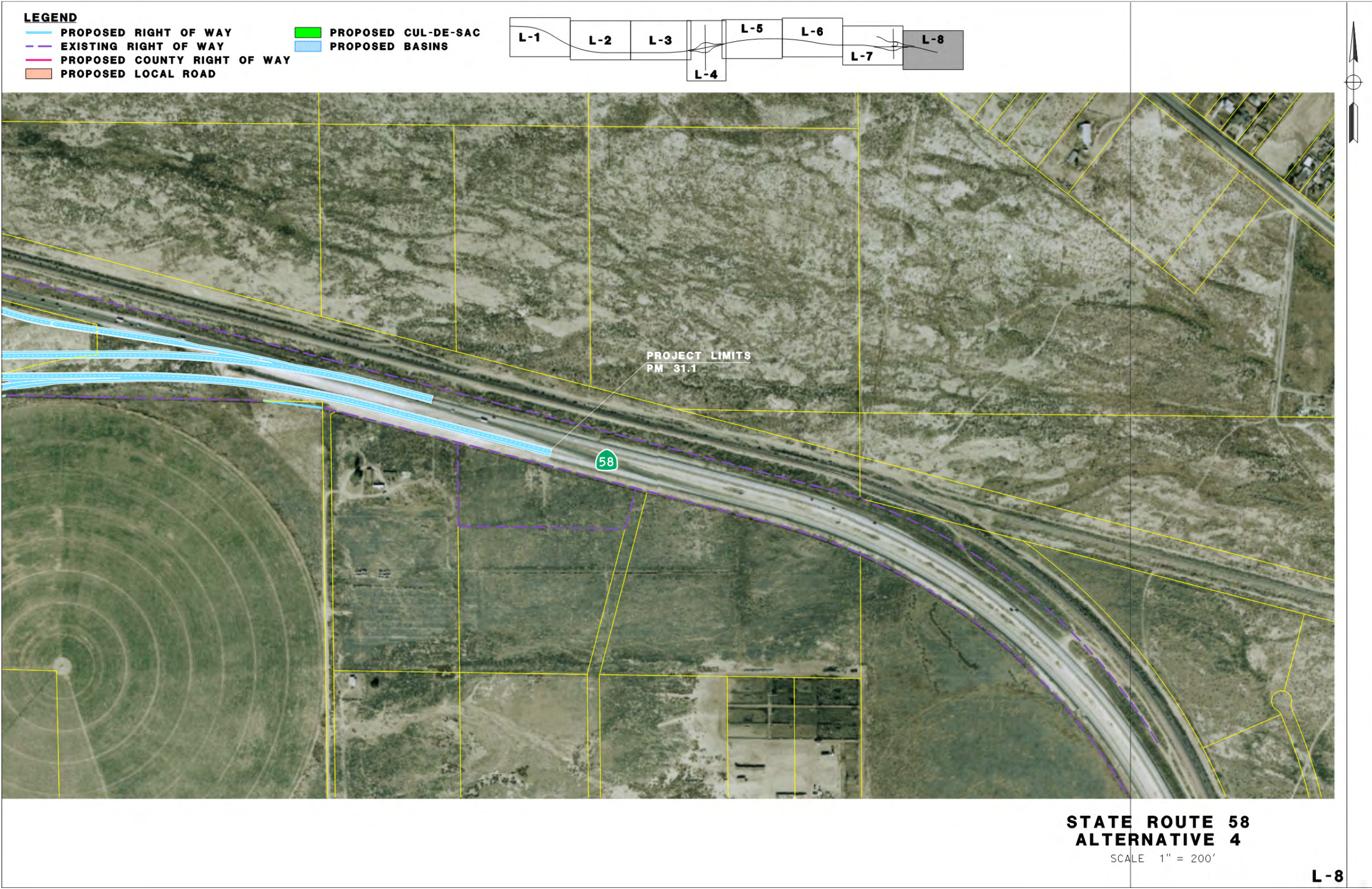
[this page left blank intentionally]

Figure 2.3: Alternative 4 – Northerly Alignment, Sheet 7



[this page left blank intentionally]

Figure 2.3: Alternative 4 – Northerly Alignment, Sheet 8



[this page left blank intentionally]

2.2.1.1 Common Design Features of the Build Alternatives

The project would widen SR-58 from a two-lane conventional highway to a four-lane expressway with full access control. See Figure 2.5 for the typical cross-sections for all alternatives. The expressway would include:

- 12-foot standard traveled way lanes,
- 10-foot standard shoulder widths, and
- 78-foot-wide median.¹⁴

For the mainline, standard lanes and standard shoulders are 12 feet and ten feet wide, respectively. The standard width for ramps is 12 feet, and the shoulders for those ramps are four feet on the left, and eight feet wide on the right (see Figure 2.4). For the local (overcrossing) streets within State right of way, standard lanes and shoulders are 12 feet and eight feet wide, respectively. For the local streets outside State right of way, standard lanes and shoulders would meet County roadway requirements.

Lighting and fencing would be detailed during final design; however, standard lighting at the exit peel-off and entrance merge locations would be provided. These lights are a standard feature and are used in both urban and rural settings, but they are designed to illuminate the roadway only. Fencing designed in accordance with the protocols provided in Chapter 8 of the Desert Tortoise Field Manual (USFWS 2009) will be installed to exclude desert tortoises from all work areas and rights of way. In addition to installing Permanent Desert Tortoise Fence, right of way fencing will be installed along the entire limits of the project.

Drainage crossing locations and sizes shown on the maps are approximate. Final design plans would show all applicable details. The project proposes access to non-motorized transportation modes (e.g., pedestrian/bikes/equestrian) by providing 6-foot wide sidewalks as well as standard 8-foot shoulders across the two overcrossing bridges at Lenwood and Hinkley Roads.

A short length of the existing SR-58 at the east end of the project would be realigned to tie in to the Lenwood Road westbound (WB) entrance and exit ramps. This realigned roadway would be constructed on a fill section (elevated sections of a roadway). All locations with large vertical surfaces (i.e., retaining walls, sound walls, and bridge structures) would include aesthetic/architectural treatment to prevent graffiti.

Two Interchanges

Two interchanges (I/Cs) would be constructed – one at Hinkley Road and the other at Lenwood Road. The ramps would include shoulder widths of four feet on the left and eight feet on the right and standard traveled way (12-foot) widths. All entrance ramps (WB and eastbound [EB]) would have two lanes at the local road and would transition to a single lane prior to merging onto the expressway. Unless otherwise specified, all exit ramps (WB and EB) would have one lane as they diverge from the expressway and would transition to two lanes prior to intersecting the local road. All exit ramps would also have three-way stops at the exit ramp intersections with the local road. Americans with Disabilities Act (ADA) compliant curb ramps would be included, where applicable. Typical cross sections for the interchanges are shown in Figures 2.4 through 2.5.

¹⁴ Final design will comply with the policies, principles, and standards contained in the “Highway Design Manual.”

Hinkley Road. The Hinkley Road I/C would be constructed as a spread diamond type interchange.

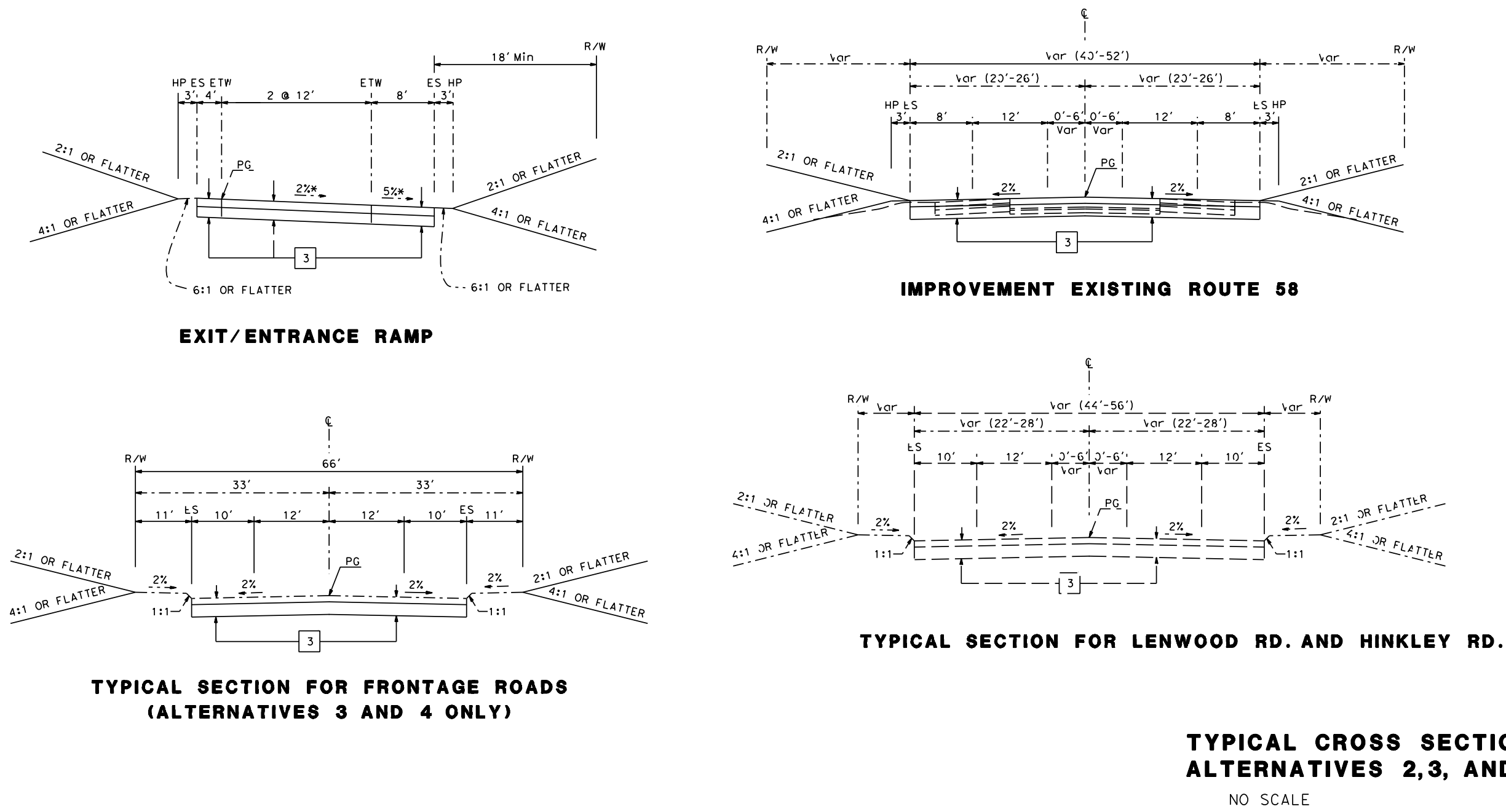
Lenwood Road. The Lenwood Road I/C would be constructed as a partial cloverleaf with partial diamond type interchange. In addition to two lanes at the local road, the WB exit ramp would also include a left turn pocket. Also, dissimilar to all other entrance ramps, the WB entrance ramp will only be one lane. It would also be constructed as a loop entrance sharing the same structural section with the WB exit ramp. A concrete curb would separate this entrance from the exit ramp. Lenwood Road would also involve improvements to accommodate the Burlington Northern Santa Fe (BNSF) rail line, which is described in detail in the “Railroad Involvement” subsection, below.

The Lenwood and Hinkley Road overcrossing bridges have similar characteristics as follows:

- Lengths ranging from 250 to 260 feet;
- Minimum widths of 64 feet 5 inches;
- Three 12-foot wide lanes;
- Two 10-foot wide shoulders; and
- One six-foot wide sidewalk on one side.

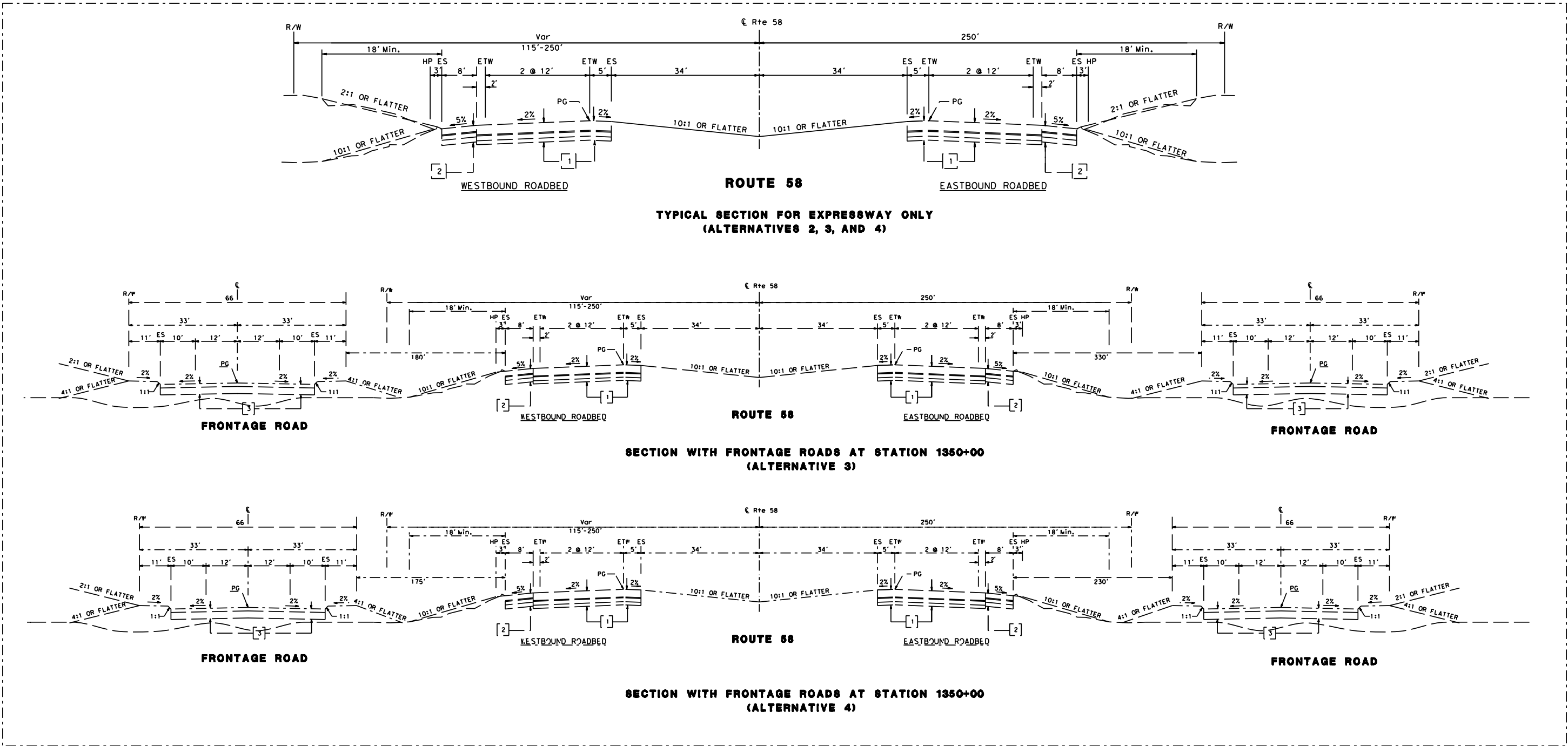
Locations of the frontage road at the I/C depend on spacing requirements between ramp-termini and frontage road intersections. Away from the I/C, locations depend on other supporting features for the mainline such as drainage and associated headwalls and/or detention/retention basins. The typical section shown for SR-58, presented in this environmental document, is for the transition from the existing SR-58 to the ramp terminus on Lenwood Road within the proposed State right of way. SR-58 typical sections, as presented (see Figures 2.4 and 2.5), would be retained until final design is completed.

Figure 2.4: Typical Cross Sections



[this page left blank intentionally]

Figure 2.5: Cross Sections by Alternative



[this page left blank intentionally]

Borrow/Fill Material Sites

The construction contractor will be responsible to determine which material sites to use for imported material, and to ensure any site is environmentally cleared and, if applicable, permitted. The borrow material will be required to be clean (free of hazardous wastes). Import material specifics and locations would be part of the final design phase for this project, and incorporated into the Plans, Specifications, and Estimates section of the project contract. Excavated material that is not useable on the construction site would be used as fill elsewhere or would be transported for disposal in an approved landfill. Any material found to be contaminated would be analyzed to identify the type and level of contamination and then transported for disposal in an approved landfill.

One optional site which would be available to the contractor would be the Caltrans Opah Material Site, which has been cleared environmentally and is approximately 16 miles northeast from Hinkley, off of I-15.

Local Access to SR-58 Expressway and Changes to Local Roads

Direct access to SR-58, as currently exists from local roads, would be eliminated at all locations except for Hinkley Road and Lenwood Road. The interchanges would allow local traffic to pass over SR-58, and continue on to local destinations.

Hinkley Road and Lenwood Road would be constructed with the following design features in the vicinity of the new SR-58:

- Standard 8-foot shoulder width,
- two lanes with standard 12-foot traveled lane width,
- a left-turn pocket, and
- ADA-compliant curb ramps, sidewalks, and crosswalks with striped/visible markings, where needed.

After the new SR-58 is complete, the existing SR-58 will be relinquished to the County of San Bernardino. The existing SR-58 will remain as a two-lane roadway and serve as the local frontage road. The existing SR-58 at the west end of the project will be terminated with a cul-de-sac.

The existing SR-58 from Fairview Road to Lenwood Road will remain and would be relinquished to the County of San Bernardino. Under Alternative 4, frontage roads were proposed on both sides of the SR-58 facility near the Hinkley Road I/C (see Figure 2.5).

Drainage/Detention Basins

Drainage facilities will be installed to handle on-site as well as off-site storm runoff and limit drainage flows across the expressway. Because the existing highway follows the natural terrain, the existing drainage flows across the highway at the low points or dips in the roadway. However, culverts will be built to convey water in its natural course across the new SR-58. Detention basins are also included in the project design in order to minimize concentration of stormwater flow crossing the expressway.

Wildlife Crossing/Fencing

Desert tortoise is a federally listed endangered species and fencing would be provided at key locations throughout the project area to minimize the potential for impacts on this species.

Drainage facilities will allow crossing for small animal species underneath the new SR-58. Approximately seven of the 33 drainage culverts will be designed as soft bottom culverts (with minimum dimension of 36 by 54 inches) to function as wildlife crossings for Desert tortoises. Wildlife crossings are discussed in detail in section 3.21 Threatened and Endangered Species.

As stipulated in measures BIO-16 and BIO-17, which are based directly on the Biological Opinion issued March 29, 2013 by the United States Fish and Wildlife Service prior to the start of construction, Caltrans will require the contractor to install fencing to exclude desert tortoises from all work areas and rights of way under the direction of an authorized biologist. Caltrans will construct the fence according to the protocols provided in Chapter 8 of the Desert Tortoise Field Manual (USFWS 2009). Permanent Fence (Type Desert Tortoise). Caltrans will maintain the integrity of the fence to ensure that desert tortoises are excluded from the work area during construction and from the roadway thereafter. The fence will be inspected regularly; initially, it will be inspected on a monthly basis, but Caltrans may adopt a different schedule, based on experience. Caltrans will inspect and, if necessary, repair the fence immediately after any rainstorm that occurs during times of the year or at temperatures when desert tortoises are likely to be active. Measures BIO-16 and BIO-17 are found in Section 3.21.4 and Appendix E of this Environmental Document.

Cut and Fill

With the exception of the westerly end of the project area, the expressway would be primarily on fill. Permanent erosion control would be selected during the design phase, in accordance with Caltrans' Landscape Architecture Erosion Control guidance and standard, and would be applied to all embankments and disturbed areas. The expressway would be designed to include:

- fill slopes at 10:1 (typical), and
- median cross slopes no steeper than 10:1.

Ramps, local street improvements, and the Lenwood Road Overhead would be designed to include:

- fill slopes no steeper than 4:1, and
- cut slopes between 2:1 and 4:1 (variable).¹⁵

Based upon preliminary engineering efforts to date, it is estimated that construction of the Preferred Alternative (Alternative 2) will require approximately 2.3 million cubic yards of material.

Utility Relocation

Several utility types may require relocation so that they can continue to function, including overhead and underground electrical, underground gas, overhead and underground telephone,

¹⁵ Final design will comply with the policies, principles, and standards contained in the *Highway Design Manual*.

overhead cable telephone, water, septic tanks, petroleum pipeline, and underground fiber optic. Based on an initial utility search, the following agencies/companies maintain utilities within the project area: (1) Southwest Gas, (2) Verizon, (3) Time Warner, (4) Southern California Edison, (5) Sprint, (6) Pacific Gas & Electric (PG&E), (7) San Bernardino County Special District Area 70, (8) Mojave Pipeline Operating Company, (9) El Paso Natural Gas Company, and (10) Mojave Water Agency. Underground utilities that cross the highway would be encased per Caltrans policy.¹⁶

All wells will be relocated outside of the proposed state right of way, and existing wells within the state right of way will be capped.

Railroad Involvement

As part of each alternative, a bridge structure would be built to allow Lenwood Road to cross over the BNSF railroad tracks. A bridge would be constructed at this location, which would provide one travel lane in each direction along with a left-turn median.

Retaining Wall

One retaining wall would be added adjacent to BNSF right of way to retain the fill slope for the Lenwood westbound off-ramp.

Staging Areas

Existing SR-58 and local roads would be used as construction staging areas where possible. Staging plans would be developed during the design phase of the project, coordinated with the County, and finalized prior to project construction.

Accommodation of Oversized Trucks

The STAA designates SR-58 (between I-5 and I-15) as a designated route for oversized trucks. Access control, separate local and expressway traffic, and new structural sections would accommodate oversize loads. The project alignment would also provide an increased ability to handle high volumes of truck traffic, and thereby would reduce long-term maintenance costs.

Design Exceptions and Status of Approval

The following features have been identified as necessary design exceptions, and are currently undergoing approval. They are summarized as follows:

Mandatory Exceptions

(1) Standard superelevation rates vary between 8-12%. Achieving the standard superelevation rate for the Hinkley and Lenwood interchanges requires larger curve radii at the ramp termini and lengthening the westbound on-ramp, which requires additional right of way. Therefore, the full standard superelevation rates¹⁷ will not be provided at the

¹⁶ Caltrans *Project Development Procedures Manual*. Appendix LL. Available at: http://www.dot.ca.gov/hq/opdpd/pdpm/apdx_pdf/apdx_ll.pdf

¹⁷ *Highway Design Manual* 6th Edition, May 7, 2012 (HDM) Index 202.2 states “Based on an e_{max} selected by the designer for one of the conditions, superelevation rates from Table 202.2 shall be used within the given range of curve radii.”

interchange ramps or along the existing SR-58 improvement that ties into the westbound ramp at Lenwood. Superelevation rate exceptions ranging between 3-8% are being requested.

(2) For new construction or major reconstruction, access rights are typically acquired on the opposite side of the local road from ramp terminals to preclude the construction of future driveways or local roads within the ramp intersections (Transportation Research Board 2000 and 2010). State access rights will not be acquired on the opposite side of the Lenwood westbound off-ramp because, although access is needed to connect the existing SR-58 to the Lenwood interchange, that portion will be relinquished to the County following completion of the project.

Advisory Exceptions

(1) Two curb ramps will not be installed at each corner of the Hinkley Road and Lenwood Road I/C. Curb ramps would be provided for pedestrian access on only one side of each I/C¹⁸ because pedestrian movements would be mainly in the north-south directions. There would be no businesses at any of the four quadrants due to the vehicle turning movements; therefore there is no need for pedestrians to cross the road in the east-west direction at the ramp termini.

2.2.1.2 Results of Value Analysis Study

Passage of the National Highway Systems (NHS) Act of 1995 included a mandate directing the U.S. Secretary of Transportation to develop a program requiring State Departments of Transportation to carry out a Value Analysis (VA) study for all Federal-aid projects on the NHS costing \$25 million or more. In 2005, the federal government enacted the “Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users” (SAFETEA-LU) with new provisions and regulations. SAFETEA-LU expanded the scope of the 1995 Value Engineering legislation to include all projects on the Federal-aid system with an estimated project cost (capital and support costs) greater than or equal to \$25 million. Title 23 USC Section 103 describes the “Federal-aid system” as the NHS and the Interstate System.

The goal of any VA Study is to improve value by sustaining or improving performance attributes of the project while at the same time reducing overall cost (including lifecycle operations and maintenance expenses). VA Alternatives are developed by the VA team as items to be considered as alternatives to either replace or enhance elements of the original concept, which in the context of a VA Study, is the design solution that is used as the baseline or starting point for the VA Study. The results of a VA Study may include new build alternatives to analyze, or design details that may be incorporated into one or more existing build alternatives, depending on whether they can be incorporated into the preliminary engineering and/or final design of the project.

A VA study was conducted for the project in October of 2002. The Value Analysis team identified nine ideas that were developed as value analysis alternatives, and analyzed using Value Analysis tools. Two of the nine value analysis alternatives presented with the results of the

¹⁸ *Highway Design Manual* 6th Edition, May 7, 2012 (HDM) Index 105.4 states: “(2) On new construction, two ramps should be installed at each corner on the Standard Plans.”

VA study for this project were accepted and one value analysis alternative was conditionally accepted.

Value Analysis alternative 1.2, “[e]liminate frontage road by buying the properties or paying access cut-off damages” was one of the two value analysis alternatives accepted. In conjunction with the preliminary engineering for the project that has occurred since the VA Study, this VA alternative has not been incorporated into the design of Alternative 3 and Alternative 4, however, it has been incorporated into the design of Alternative 2. Frontage roads have been included in Alternative 3 and Alternative 4 to maximize local access to the re-aligned SR-58 eliminating frontage roads through acquisition of parcels is not considered feasible because the costs involved would be well beyond the cost of constructing frontage roads, due to the quantity of these parcels being developed. The design of Alternative 2 is not planned to require construction of a frontage road, if parcels located between the western limits of the project, extending south of the Alternative 2 alignment to Valley View Road are acquired. Local access to the re-aligned SR-58 as constructed for Alternative 2 would be maximized through use of the existing SR-58 highway, which would be relinquished to the County of San Bernardino following construction of the project; as a result Alternative 2 will not require construction of a Frontage Road.

Value Analysis alternative 5.0, “[r]educe sound/noise by using earth berms” was the other value analysis alternative accepted. In conjunction with the preliminary engineering for the project that has occurred since the VA Study has not been incorporated. Based on the results of the required Noise Study Report, no sound barriers are considered reasonable for Alternative 2 and Alternative 3, based on the reasonableness criteria, because the projected abatement cost for each barrier considered would exceed the reasonableness allowance. No sound barriers were considered reasonable for Alternative 4 either, except for one area located approximately along the right of way line roughly parallel to Frontier Road, located approximately between Summerset Road and Anson Road. The type of noise abatement for this location would have required less right of way than a barrier using an earth berm.

Value Analysis alternative 4.0, “[p]rovide accel/decel lane at all at-grade intersections” was value analysis alternative that was conditionally accepted. The condition was to accept the deceleration lanes on SR-58 at the at-grade intersection and reject the acceleration lanes. In conjunction with the preliminary engineering for the project that has occurred since the VA Study, interchanges have been incorporated into the designs of all three studied build alternatives, instead of accel/decel lanes at at-grade intersections.

2.2.1.3 Unique Features of Build Alternatives

Alternative 2: Realign and Widen to Four-Lane Expressway (Southerly Alignment)

Under Alternative 2 (see Figure 2.1), a new alignment will diverge from the existing alignment approximately two miles west of Valley View Road in a southeasterly direction to Valley View Road just south of Frontier Road, continuing along a gentle curve easterly from Valley View Road until it rejoins the existing alignment approximately 0.75 mile east of Lenwood Road. The alignment would run approximately 0.5 mile south of the existing SR-58 alignment.

Local Roads/Cul-de-sacs

After project construction, existing SR-58 will remain as a two-lane roadway, terminating on the west end as a cul-de-sac as shown on Figure 2.1. This portion will be relinquished to the County of San Bernardino following completion of the project.

Additional cul-de-sacs will be placed:

- South of new SR-58: Camino Road.
- North of new SR-58: Valley View Road, Valley Wells Road, Locust Street.
- North and South of new SR-58: Mountain View Road, Fairview Road, Summerset Road, Dixie Road.

For portions of existing SR-58 that would not continue to be used as roadway, the pavement will be removed, hardened earth dug up, and seeded with natives to rehabilitate the earth to a natural condition.

The proposed right of way line for the re-aligned and widened State Route 58 as shown on Sheet 1 and Sheet 2 of Figure 2.1 for Alternative 2 earlier in this chapter, corresponds to the right of way requirements line; established based on the need to meet the required maximum 2:1 slope for roadway (grading), drainage, maintenance access, and embankment materials for the project during the preliminary engineering phase of this project. This is not a major source of fill for the project. If it is determined during the Final Design phase of the project that not all of the right of way shown on these two sheets is needed to address the identified requirements, the right of way limits for this portion of the re-aligned and widened State Route 58 will be further evaluated.

Contingent upon whether the results of the evaluation determine that changing the right of way requirements line for this part of the project would result in other additional or increased impacts to this part of the project area, the right of way limits for this portion of the re-aligned and widened State Route 58 may be revised.

Design Updates since Circulation of the DEIR/EIS

As discussed in Section 2.2.2 Identification of a Preferred Alternative later in this chapter, following conclusion of the public circulation and review of the DEIR/EIS prepared for this project, on February 26, 2013 the PDT affirmed Alternative 2 to be the Final identified Preferred Alternative for the project.

In an effort to further minimize right of way impacts and relocations, Caltrans Design and Right of Way determined that it would be possible to further reduce the actual number of anticipated relocations of Hinkley residents if the project design included some improvements to local roads. Modifications were made to the design of Alternative 2. Caltrans Design and Right of Way worked together in conjunction with identifying the local roads to improve (shown on Figure 2.1 Sheets 1 and 4, earlier in this chapter). The modifications include the addition of a short paved roadway segment extending northward on the western end of the alignment. This short segment provides access to a cul-de-sac along the existing SR-58, which in turn provides access to properties on the northern side of the alignment. In addition to the roadway segment on the western end of the alignment, the designs of four local roads adjacent to the new Hinkley Road interchange, as located based on Alternative 2 were modified. To the northwest of the proposed

interchange, a roadway segment would be paved and extended westward from Hinkley Road to provide property access and an additional segment with a cul-de-sac would extend southward from the western end of the segment. To the southeast of the Hinkley Road interchange, Pioneer Road would be paved to the east of Hinkley Road to its intersection with Camino Road, and Camino Road would be paved and extended northward to end in a cul-de-sac to the south of the Alternative 2 SR-58 alignment. The paved roads occur along existing property access areas and only secure ingress/egress for existing private properties. As already noted, constructing improvements to the local roads identified above will reduce the project's impacts with respect to displacement of community members.

This update to Alternative 2 was reviewed by Caltrans staff to determine if any additional impacts to other facets of these parts of the project area would result. Based on this review, it was concluded that no additional impacts would result. As part of this review Caltrans Biological Studies contacted USFWS to confirm whether the completed Section 7 consultation would need to be re-opened and was informed that it would not need to be re-opened. Additionally, Caltrans Cultural Studies performed analysis and concluded no impacts to cultural resources would result.

This update to Alternative 2 was discussed with the County of San Bernardino. The location of these improved local roads was planned by Caltrans to be consistent with the County's Master Road Plan in this area, which the County confirmed. The County confirmed their willingness to take on maintenance of the improved local roads into perpetuity, though requiring that the improved local roads be paved and designed in accordance with applicable County standards. Applicable standards included lane widths, roadbed design, and asphalt material. It was confirmed in the meeting with the County that these roads would provide only one lane in each direction with no median, curbs, AC dikes, or shoulders.

Local travel patterns are not changed by the improvements to these local roads, rather they are maintained.

The Caltrans meetings with representatives from the County of San Bernardino to discuss the Alternative 2 design updates summarized above, also included discussion of the planned relinquishment of the portion of the existing SR-58 facility to the County that will be replaced by the re-aligned and widened portion of SR-58 constructed by this project.

Slope Easement

A shaded area identified as a proposed grading easement, shown located southwest of the planned new SR-58 at Hinkley Road interchange on Sheet 4 of Figure 2.1 for Alternative 2 in Chapter 2 of the circulated DEIR/EIS, is now identified as a slope easement¹⁹ as shown on Sheet 4 of Figure 2.1 for Alternative 2, earlier in this chapter. The size of this easement has not changed.

¹⁹ As discussed in "Land Surveys For Rights of Way" by R.W. "Russ" Forsberg, April 1991, a slope easement is a permanent right to construct and maintain a slope on land abutting upon the right of way for a transportation facility. The slope is needed for the support of the facility and must remain in place as long as the facility is present unless the abutting owner wants to grade his land in such a way as to eliminate the need for the slope. A slope easement is limited to constructing and maintaining slopes. Drainage facilities or other features related to the transportation facility are not covered by a slope easement. The owner(s) of property utilized for a slope easement are compensated for this easement.

This slope easement is intended to allow water to flow to the planned basin located adjacent to what will be the eastbound SR-58 off-ramp to Hinkley Road. This area will not be used as a material site.

Alternative 3: Widen Existing SR-58 to Four-Lane Expressway (Existing Alignment)

Under Alternative 3 (see Figure 2.2), the new facility would run along the existing SR-58 alignment. The new alignment would diverge from the existing alignment just west of Mountain View Road along a gentle curve southeasterly to Lenwood Road, for approximately 3 miles. At the easterly end of the project limits, the alignment would be adjusted to avoid encroachment on the BNSF railroad. Of all the project build alternatives, Alternative 3 would have required the most area for construction staging due to lack of open space areas and its proximity to existing structures within the Hinkley community. This alternative would also require elaborate stage construction and associated cost to maintain the operation of SR-58 during construction.

Frontage Roads/Cul-de-sacs

After project construction, the easterly portion of existing SR-58 would remain as a two-lane roadway and would serve as a frontage road. This easterly portion of existing SR-58 would be relinquished to the County of San Bernardino.

Frontage roads would also be constructed to the north and south of the widened SR-58 in order to maintain access to adjacent properties. This would occur between (1) Valley View Road and Summerset Road and (2) Fairview Road and Lenwood Road.

The new local frontage roads would parallel the existing right of way, and then transition into curving alignments that would take them approximately 0.25 mile south and north of the widened roadway to their points of intersection with the existing north–south collector streets.

Utility Relocations

Beyond the utilities identified under “Common Design Features,” this alternative would require relocation of a number of overhead utility poles associated with a utility substation.

Alternative 4: Realign and Widen to Four-Lane Expressway (Northerly Alignment)

Under Alternative 4 (see Figure 2.3), the realignment and widening of SR-58 would have occurred slightly north of the existing SR-58. The new alignment would diverge from the existing alignment approximately 0.75 miles west of Valley View Road in a northeasterly direction, and would parallel the existing alignment of SR-58 on the north side until it rejoins the existing alignment approximately 0.75 miles east of Lenwood Road.

Frontage Roads/Cul-de-sacs

After project construction, existing SR-58 would remain as a two-lane roadway; terminate on the west end as a cul-de-sac, and serve as a frontage road (between the cul-de-sac and Flower Street and also between Mountain View Road and Lenwood Road). These portions would be relinquished to the County of San Bernardino.

Frontage roads would also be constructed to the north and south of the widened SR-58 in order to maintain access to adjacent properties. This would occur between (1) Valley View Road and Mountain View Road, north of the alignment and (2) Valley View Road and Summerset Road, south of the alignment.

The new local frontage roads would parallel the existing alignment but transition into curving alignments that would take them approximately 0.25 mile south and north to their points of intersection with existing north–south collector streets.

Utility Relocations

Beyond the utilities identified under “Common Design Features,” this alternative would require the relocation of a number of overhead utility poles associated with a utility substation.

Noise Barriers/Walls

An eight-foot noise barrier/wall was proposed under Alternative 4. The noise barrier/wall would be constructed on the south side of SR-58 along the proposed right of way. The west end of the noise barrier/wall would be located approximately 1,555 feet east of Summerset Road and the east end of the barrier would be located approximately 1,823 feet east of Summerset Road.

2.2.1.4 Transportation System Management (TSM) and Transportation Demand Management (TDM) Alternatives

Transportation Systems Management (TSM)/Transportation Demand Management (TDM) measures are strategies to enhance the efficiency of the transportation system while lowering cost. TSM measures seek to increase the number of vehicle trips that can be carried without adding lanes. TDM focuses on regional strategies for reducing vehicle trips and miles traveled and increasing vehicle occupancy. The population of the Community of Hinkley was approximately 920 in 2010 and the City of Barstow population was approximately 22,639 in 2010. As identified in California Government Code § 65080 (b) (1) the policy element of transportation planning agencies is based on populations that exceed 200,000 persons for their regional transportation plans in regards to the development of measures of mobility and traffic congestion, including, but not limited to, daily vehicle hours of delay per capita and vehicle miles traveled per capita.

The populations within and nearest to the project area are not larger than 200,000 persons, as a result does not meet the requirements of California Government Code § 65080. Therefore, a separate TSM/TDM alternative was not evaluated for the Project.

2.2.1.5 Alternative 1: No-Build (No-Action) Alternative

Under Alternative 1, SR-58 would remain as is without any improvements. SR-58 is currently operating at level of service (LOS) “E” and without improvements it is forecasted to operate at LOS “F” by 2040 (Section 1.3.2.1). Continuing local development and increasing traffic volumes would add to congestion and traffic delay, and would likely cause deterioration in accident rates, operational efficiency, and structural deficiencies. This alternative would not address the problems identified within this segment of SR-58. This alternative is referred to as the No-Build Alternative throughout this document.

2.2.2 Identification of a Preferred Alternative

Full consideration was given to the technical studies prepared for the proposed alternatives, and data was carefully analyzed for all alternatives on an equal basis. After comparing and weighing the benefits and impacts of all of the feasible alternatives, at a Project Development Team (PDT) meeting on December 6, 2012, the PDT identified Alternative 2 as the preferred alternative, subject to public review.

The rationale which the PDT employed follows.

The key benefits of Alternative 2 include:

Alternative 2 achieves the purpose and need of the project, and provides the same level of operational improvement as the other two build alternatives (Alternative 3 and Alternative 4).

All three build Alternatives 2, 3, and 4 would result in substantial operating improvements with LOS C or better in the design horizon year of the project (2040), while providing the benefits of improved safety with the grade separation of higher speed SR-58 traffic, elimination of the lane drop, and separation of the slower and bigger truck traffic. However, Alternative 2 is expected to cost substantially less, estimated at \$174,467,000. The other two build alternatives, are estimated to cost \$194,890,000 (Alternative 3) and \$194,803,000 (Alternative 4), respectively.

On February 26, 2013, following conclusion of the circulation period for the DEIR/EIS, and after careful consideration of the comments received during circulation, the PDT affirmed that Alternative 2, initially identified as the Preferred Alternative at a PDT meeting in December 6, 2012, is the final identified Preferred Alternative for the project. See Chapter 5 of this document for a summary of the Open Forum Public Hearing as well as the responses provided to the comments received during circulation of the DEIR/EIS along with the transcript.

As summarized below, Alternative 2 is expected to result in substantially fewer parcels needing to be acquired, and more specifically, is also expected to result in substantially fewer displacements of homes, businesses, as well as community facilities. In addition, Alternative 3 and 4 bisect and pass through the center of the Hinkley community, and therefore have greater community character and cohesion impacts than Alternative 2 (which skirts the southern fringe of the community).

Alternative 2	Alternative 3	Alternative 4
Acquisitions/Displacements: <ul style="list-style-type: none"> • 28 full acquisitions • 65 partial acquisitions • 16 residential units • 2 agricultural operations 	Acquisitions/ Displacements: <ul style="list-style-type: none"> • 77 full acquisitions • 150 partial acquisitions • 44 single-family residences • 2 multi-family residential units • 3 commercial businesses/non-profit • 1 farm 	Acquisitions/Displacements: <ul style="list-style-type: none"> • 75 full acquisitions • 119 partial acquisitions • 34 single-family residences • 2 multi-family residential units • 1 commercial business/non-profit • 1 farm

For the community of Hinkley, hazardous waste and the groundwater plume is a major issue, and impacts to hazardous materials and the mitigation systems which others have installed are a major consideration. Alternative 2 is expected to result in substantially fewer Pacific Gas and

Electric (PG&E) wells in the project area being impacted, and would specifically avoid any impacts to any PG&E extraction wells and USGS wells, as summarized below:

Alternative 2	Alternative 3	Alternative 4
PG&E wells potentially impacted: <ul style="list-style-type: none"> • Supply (active) – 7 • Supply (inactive) – 2 • Monitoring (active) – 6²⁰ 	PG&E wells potentially impacted: <ul style="list-style-type: none"> • Supply (active) – 21 • Supply (inactive) – 13 • Monitoring (active) – 11 • Extraction (active) – 1 • Extraction (inactive) – 1 	PG&E & USGS wells potentially impacted: <ul style="list-style-type: none"> • Supply (active) – 14 • Supply (inactive) – 14 • Monitoring (active) – 19 • Extraction (active) – 1 • Extraction (inactive) – 1 • USGS – 2

Regarding biological resources, it is currently expected that Alternative 2 would impact more acres than Alternative 3 or Alternative 4. Specifically, Alternative 2 is expected to impact 2.815 acres of California Department of Fish and Game (CDFG) jurisdictional waters, in comparison to Alternative 3 (expected to impact 0.625 acres) and Alternative 4 (expected to impact 0.707 acres). Alternative 2 will also result in more acres of vegetation and animal species habitat being impacted, including impacts to habitat for Desert Tortoise and Mohave ground squirrel (549.71 acres impacted by Alternative 2, 409.62 acres impacted by Alternative 3, and 427.31 acres impacted by Alternative 4).

The ability to mitigate impacts to these specific biological resources versus the ability to mitigate impacts to existing residences and businesses located in the project area, as well as the ability to minimize impacts to existing PG&E wells in the project area, is a major factor considered by the PDT in conjunction with identifying Alternative 2 as the Preferred Alternative.

The potential impacts of the project to the community with respect to potential displacements and acquisition of property, minimizing impacts to PG&E wells in the project area, and the overall cost of the project in conjunction with satisfying the purpose and need for the project were the key criteria in the final identification of the Preferred Alternative following public circulation of the Draft Environmental Impact Report/Environmental Impact Statement prepared for this project. For further details on impacts, please see the Summary Table, and Chapter 3 of this Environmental Document.

Planned Project Schedule (Major Milestones) through Construction

The anticipated schedule for the three major project development milestones; project approval, final design, and construction, all based on the Preferred Alternative is as follows (as of preparation of this Final EIR/EIS:

- Project Approval and Environmental Document (PA&ED) - Summer 2013
- Completion of Final Design - Summer 2014
- Completion of Right of Way acquisition process - Summer 2014

²⁰ Of the six monitoring wells only two are expected to require relocation, the other four are expected to only require adjustment in place.

- Begin construction - Fall 2014
- End construction/Open to traffic - Fall 2016

2.2.3 Alternatives Considered but Eliminated from Further Discussion Prior to Draft Environmental Impact Report/Environmental Impact Statement

2.2.3.1 Humpyard Alternative

This alternative is discussed and was eliminated in the 1991 Project Approval Report (PAR) for SR-58. This alternative would have followed the same alignment as the current highway until PM 31.1, where it would have moved 1.9 miles southeasterly over the Mojave River and the BNSF Railroad Humpyard, and then tied into I-15 at the existing West Main Street interchange. It was eliminated from further discussion due to its less direct route, conflicts with existing homes, developed land, and prohibitive costs associated with crossing over the Humpyard and Mojave River (Caltrans 2012b), construction and staging problems (with the bridge over the Humpyard), and local support for the project (Caltrans 2012b). The Project Approval Report was not issued for this project because the purpose/need and preliminary design were revised based on comments received.

2.2.3.2 Rimrock Alternative

This alternative is also discussed in the 1991 Project Approval Report for SR-58; however, similar to the Humpyard Alternative, it was eliminated from further discussion due to its less direct route, creating operational deficiencies, conflicts with existing homes, developed land, and costs associated with crossing over the Humpyard and Mojave River. It also would not cumulatively meet SR-58/I-15 FHWA freeway spacing requirements, would lack proper weaving/merging distances, and would have mixed freeway to freeway (regional traffic) with local road traffic. The Project Approval Report was not issued for this project because the purpose/need and preliminary design were revised based on comments received.

2.2.3.3 Alternatives Identified at the 2007 Scoping Meeting

All alternatives and alignments suggested by the community from the scoping meeting on June 26, 2007, were evaluated for engineering, cost, right of way, and environmental factors.

Northerly Alignment B, Parallel to SR-58: A recommendation was received to consider an alignment north of existing SR-58, and parallel to the BNSF railroad. This alternative was not selected for further study due to higher cost and similarity in concept and impacts to existing Alternative 4 (Northerly Alternative), which is carried forward for further evaluation within this environmental document.

Outlet Center Drive: A recommendation was received to create a project alignment which would bypass the community of Hinkley and connect to I-15 approximately one mile north of Outlet Center Drive. Upon review of this alternative, it was determined that Caltrans had previously considered a similar alternative (the Rimrock Alternative); however, it was not carried forward due to the following reasons:

- the new connection point at I-15 would not meet requirements for minimum separation distance between interchanges,
- there is an already existing SR-58 connection to I-15,
- much higher right of way impacts, and
- additional environmental footprint and impacts (primarily due to crossing over the Mojave River).

Modified Build Alternatives: Modifications to Alternative 2 (Southerly Alignment), Alternative 3 (Existing Alignment), and Alternative 4 (Northerly Alignment) were proposed and named 2MOD, 3MOD, and 4MOD. These alternatives provided interchanges at Valley View Road, Hinkley Road, Summerset Road, and Lenwood Road. These modified alternatives were not selected for further study because of:

- traffic data for Valley View Road and Summerset Road did not support the need for interchanges at these locations,
- the much higher cost, due to extra required freeway interchanges,
- increased right of way requirements, and
- larger environmental footprint impacts compared with Alternatives 2, 3, and 4.

2.3 Permits and Approvals Needed

Table 2-1 on the following page provides a list of permits, reviews, and approvals that would be required for project construction.

Table 2-1: Permits and Approvals Needed

Agency	Permit/Approval	Status
County of San Bernardino	<p>Freeway agreement</p> <p>Expected to address (1) local roads that will be closed, (2) construction of the new interchanges, and, as applicable (3) relinquishment of the existing portion of SR-58 to the County that will be replaced by the realigned and widened improvement to SR-58 constructed by this project.</p> <p>Temporary construction permits</p> <p>Required for construction on County roads or other land within the project construction footprint which is owned by the County.</p>	<p>To be executed during the Final Design phase of the project.</p> <p>To be acquired during Final Design phase of the project.</p>
Burlington Northern Santa Fe (BNSF)	<p>Encroachment permit</p> <p>Required for work performed within railroad right of way.</p>	To be acquired prior to any construction activity occurring within BNSF right of way.
Bureau of Land Management (BLM)	<p>Caltrans will petition FHWA for a Highway Easement over those BLM lands needed for the project. FHWA, through a MOU with BLM, has the authority to convey land for highway purposes. BLM would remain the underlying fee owner, and the Department would have rights to construct, operate, maintain, etc. Should the proposed right of way be no longer needed for highway purposes, then the land would be quitclaimed back to BLM.</p>	To be executed during the Final Design phase of the project.
California Public Utilities Commission	<p>In accordance with addressing the Public Utilities Code Sections 1201 through 1205, for grade separated structure over BNSF rail line</p>	Application to CPUC to occur during Final Design phase of the project.
California State Water Resources Control Board	<p>Coverage under the General Permit for Discharges of Stormwater Associated with Construction Activity (Construction General Permit, Order No. 2009-0009-DWQ)</p>	Following completion of the Final Design phase of the project. NOI to be submitted prior to construction.
California Department of Fish and Wildlife, CFW (formerly California Department of Fish and Game until 2013)	<p>1602 Streambed Alteration Agreement</p>	<p>Application to CFW for 1602 agreement to occur during Final Design phase of the project.</p> <p>Application will occur During PS&E</p>
California Department of Fish and Wildlife, CFW (formerly California Department of Fish and Game until 2013)	<p>2081 Incidental Take Permit</p>	<p>Permit coordination in progress</p> <p>Needed for Desert Tortoise/Loss Desert Tortoise Habitat</p> <p>Needed for Mohave Ground Squirrel</p> <p>2081 permit process will be completed prior to end of Final Design phase.</p>
U.S. Fish and Wildlife Service	<p>Section 7 consultation for threatened and endangered species</p>	<p>Section 7 coordination complete; Biological Opinion for Desert Tortoise received March 29, 2013</p>